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AN ANALYSIS

OF THE

NATURAL CLASSIFICATIONS

OF

MAMMALIA,

FOR THE USE OF

STUDENTS AND TRAVELLERS.

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PARIS,

PRINTED BY J. SMITH.

1821.

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PREFACE.

THIS little book is compiled, principally, for the sake of those of my countrymen whose remote situations in our colonies do not permit of their acquiring the requisite knowledge of Zoology, by studying collections. By performing this duty (which I owe to them from experience and sympathy) in the present simple manner, I flatter myself a taste may not only be encouraged, but, perhaps, originated. We are always zealous, especially in unknown regions, when a certain portion of knowledge enlivens or enhances our exertions. If active pursuits, or the anxiety and hurry which generally disturb the interval between appointment and departure, have not permitted the study of the objects themselves, this manual will divert the tediousness of the voyage, and relieve the painful mortification which a sensible mind always feels on leaving scientific facilities, without having taken the necessary advantage of them.

Perhaps others of my countrymen, resident at home, who like myself are mere amateurs of Comparative Anatomy and Zoology, may thus be tempted to cultivate it as a rational and agreeable relief to more abstruse studies. I have found it such under the impatient feelings of unmerited disappointment, and during a more laborious but more congenial undertaking.*

After this explanation of my motives, the Scientific Naturalist, (to whom the text, translated under every facility for explanation and correction, may be welcome)

* The Elements of Algebra, compiled from the best authors, English and French, and now preparing for the press.

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will, I am sure, indulgently allow me to assert with Plautus :—

" Non videor meruisse laudem, culpâ caruisse arbitror."

Some of the figures are copied from Cuvier's Fossil Remains, and three or four from F. Cuvier's periodical publication of drawings of animals from the life; but the greater number are drawn from the objects themselves in the Gallery of Anatomy. They are not all arranged with as much order as might be wished, because I was tempted to add drawing after drawing, to make the classification still clearer, and thus almost doubled the number originally intended.

The first part of the text is a translation of almost all but the specific descriptions of the *Mammiferes* of Cuvier's *Règne Animal,* rendered more perspicuous by a tabular form, interwoven with additions from his Comparative Anatomy, Fossil Remains, the works of Frederic Cuvier, Dumeril, etc. and, I would hope, simplified by explanatory notes and remarks.

The second part contains a general outline of the system of Illiger, a celebrated Berlin Professor, who died young; and of which one of the most rising Zoologists of the present day has written : " *Neque apud veterem, neque apud recentiorem quendam Auctorem ullum systema invenerim, quod, tam sua perspicuitate, quam accuratione, Illigeriano magis commendari mihi videatur.*"

The remarks on the connections and gradations between the Orders and Families, form the only original matter of this Manual, and for these I am indebted to the instructive conversation and the patience and esteem of a friend, M. Kuhl, whose science and judgment as a Zoologist have been so universally admitted, that my tribute to any thing else but his goodness and amiability as a man, would be presumptuous. He has just sailed as the Conductor of a liberal scientific expedition to the East-India Islands, equally flattering to himself, promising to science, and honorable to the Dutch Government.

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GENERAL TABLE OF THE CLASSES OF ANIMALS.

With Vertebræ...	Warm blood, a heart with two ventricles.	Viviparous, with mammæ.....	1 Mammalia.
		Oviparous, no mammæ.....	2 Aves.
	Cold blood, a heart with one ventricle...	Lungs sometimes accompanied with branchiæ...	3 Reptilia.
		Branchiæ without lungs.....	4 Pisces.
Without Vertebræ.	Blood vessels and nerves.....	A simple spinal marrow, no articulated members.	5 Mollusca.
		A knotted spinal marrow,.....d°.....	6 Vermes.
		A knotted spinal marrow, articulated members..	7 Crustacea.
	No blood vessels..»..».....	A knotted spinal marrow.....d°.....	8 Insecta.
	» » no nerves.....	No spinal marrow, no articulated members.....	9 Zoophyta.

The recollection that most Insects possess touch and smell in an extremely sensible degree, whilst these senses are very imperfect in Fish, convinces us that the greater or less perfection of individual organs cannot determine the rank of an animal in a natural system of classification. The Dog is superior to Man in smell; the Cat and Eagle in sight. As regards respiration and digestion, it is notorious that Birds in general enjoy the former, and Eagles and Griffons the latter, in a much higher degree than Man. We conclude, therefore, that the superior class of an animal is indicated not by the perfection of particular organs, but of the whole; the brain and nerves being preferred, as they decrease gradually, and are entirely wanting in what are called the lowest animals, although these animals possess the power of reproduction in an eminent degree.

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Mammalia.

The neck of Mammalia, with the exception of a single species,* is formed of seven vertebræ; the number of those of the back varies from eleven to twenty-four; those of the loins, pelvis, and tail, from eleven to forty-six. The head is always articulated to the first vertebra (or the atlas); the upper jaw is always fixed to the skull, and the lower composed but of two pieces. The shoulder blade is never articulated, but is suspended in the flesh, being sometimes connected with the sternum by an intermediate bone called the clavicle. The pelvis is only wanting in the Cetacea; the joints of the fingers are generally three, but sometimes two, and more than three in the Cetacea.

The Mammalia which exercise the greatest variety of movement, as Apes and Dogs, have a skeleton composed of about 240 bones, nearly half of which enter into the structure of the head, the spine, the breast, and the basin; the other bones constitute the limbs; but their number varies considerably in the different species: the head, the neck, and the basin, are the parts which vary the least, whilst the breast, and especially the tail, offer nothing constant: the shoulder is always moveable. The head in Mammalia is articulated by ginglymus, or that species of joint which admits but of one kind of flexion; that of Birds by arthodria, which admits of flexion in every direction.

The structure of the brain is much more complicated in Mammalia than in all the other animals, and twelve pair of nerves proceed from it. They are the only class of animals with a diaphragm (a fleshy membrane separating the thorax, or the part containing the lungs, from the abdomen): they have a superior larynx, with cartilaginous semi-circles.† The number of young produced at a birth is ordinarily half the number of the mammæ.

Sensibility, irritability, and reproduction, are the three properties most worthy of our attention in Mammalia; the Apes enjoy the first in a higher degree than Man, the Feræ possess most irritability, whilst reproduction is most active in the Bisulcæ. There are four of the Orders of Mammalia, which seem to connect them with the other Classes of Vertebrated Animals: the Volitantia of Illiger (the Bats and Colugo) link them with the Birds; the Pinnépedia (Seals and Morse) and Natantia (Manati) with the Fish; and the Reptantia (Echidna and Ornithorhyncus) with the Amphibia.

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* The Aï of Guiana, which has nine.

† See my *Introduction to Ornithology*, Pl. 2, fig. 13, and note.

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VERTEBRATED ANIMALS.

Class I.

MAMMALIA.

ORDERS.

With nails and pliable fingers.

1. Bimana.

Erect position.
Great toes longer than the others, but immoveable in an opposite direction.

Three sorts of teeth; incisives, canines, and grinders.

The incisives of the lower jaw erect, and the chin projecting: 3 lobes to the brain. Pl. 3, fig. 1.

2. Quadrumana.

Great toes or thumbs of the hind feet shorter, but moveable in an opposite direction to the others, which are long and flexible, like the toes of the fore feet. (1)

Lower incisives projecting.

3. Sarcophaga.

No separate toe or thumb on the fore feet, and those behind never opposable to the others. Sharp pointed nails. (2)

No horizontal movement to the lower jaw, but the articulation transverse, so as merely to open and shut. Pl. 3, fig. 2.
No 3d lobe to the brain.
The orbit not separated from the hollow of the temple. Pl. 15, fig. 2. or compare fig. 15 with fig. 11, pl. 1.

4. Rodentia.

No canine teeth.

The articulation of the lower jaw longitudinal, so as to move only backwards and forwards. Pl. 3. fig. 3.

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5. Edentata.

Large nails enveloping the extremities of the toes, approaching to small hoofs. Pl. 4. fig. 11, 12.	No incisive teeth.	

With hoofs and immoveable fingers.

6. Pachydermata.

One toe and one hoof, or more than two.		

7. Ruminantia.

Forked feet, or two toes and two hoofs.	No incisives in the upper jaw.	Grinders with double crescents on the crown, the convexity inwards in those of the upper, and outwards in those of the lower jaw. Pl. 3, fig. 5.

8. Cetacea.

No hind feet.	No pelvis. Anterior extremities enveloped in a tendinous membrane, resembling fins. Pl. 3, fig. 8.	Body continued by a thick tail, which terminates in a cartilaginous *horizontal* fin.

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(1) There are eight bones in the carpus or wrist of Man, see pl. 8. fig. 9. I do not know whether there are more in that of the Orang, the skeletons in the Gallery in Paris being too young to determine it, but Monkeys have nine bones in the carpus; the additional one being situated between the bases of the pyramidal and the ~~suture~~ great bone. The exterior suture of the intermaxillary is never visible in Man after infancy; in Apes and the other Quadrumana it always remains so: see pl. 1, fig. 11, i. There is a suture in the nasal bone of Man shewing it to be composed of two, pl. 15, fig. 1, b; in that of Apes and the other Quadrumana there is no suture. The considerably greater length of the spinous processes of the cervical vertebræ is shewn in pl. 4, fig. 4, 5. It is said by German Anatomists, that with the exception of the Phascolomys (Wombat), the vermiform intestine is only common to Apes and Man. Blumenbach notices, that in the Orangs, and a few other Apes, the hairs of the elbow are not directed downwards, as in all the rest, but curl upwards,

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as in Man. These, I believe, are all the scattered distinctive characters not noticed in the descriptive review prefixed to each order, and literally translated from Cuvier.

(2) Cuvier places the Kanguroos (Macropus), which have no canine teeth, at the end of the order Sarcophaga, in the family of Marsupialia (or animals with a ventral pouch), which is their most natural place, especially as the canine teeth of the Phalangista, which they follow, are so small as to be scarcely visible, so that they immediately connect the Sarcophaga and the Rodentia; but it has this inconvenience in an artificial system, that the character of the teeth of this Genus, and of this Genus only, does not accord with the general character for the teeth in the Class, that of having the three kinds. In the tabular view which accompanied his Comparative Anatomy, Cuvier placed the Kanguroos with the Rodentia, which avoids the inconvenience. The hind foot of the Opossum having an opposable thumb, is also another exception to the characters of the Order of Sarcophaga: Dumeril makes them a distinct Order under the name of Pedimana.

ORDER I.

Bimana.

The foot of Man is very different to that of Apes; it is wide and flat underneath; the leg bears vertically upon it and is furnished with very strong muscles (the mass of which forms the calf) acting upon the heel, which is enlarged underneath. The toes are short and can scarcely bend; the great toe, longer and thicker than the others, is placed on the same line, and is never opposable to them. All the fingers, except the annular, have separate movements, which is not the case in other animals, not even in the Apes; and the thumb is also longer in proportion than in the latter.

The arteries which go to the brain are not subdivided, as in most quadrupeds, and the blood necessary for so voluminous an organ, rushing towards it with too much force, would occasion frequent apoplexies if Man continued in a horizontal position. No quadruped approaches him in the size and folds of that part of the brain which is the principal seat of the intellectual faculties.

The conch of the ear, having little motion or surface, does not augment the intensity of sounds, and yet Man is of all animals the most capable of distinguishing intonations. His nostrils, more complicated than those of Apes, are less so than those of all other genera, and nevertheless he appears to be the only animal whose smell is sufficiently delicate to be affected by bad odours.

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His skull has eight bones: an occipital, two temporal, two parietal, a frontal, an ethmoidal, and a sphenoidal. There are fourteen bones in the face: two maxillaries, two jugals, each of which is joined to the maxillary on the same side by a kind of handle called the zygomatic arch; two nasals, two palate bones, a vomer between the nostrils, two cornea in the nostrils, two lachrymals on the internal sides of the orbit, and the single bone of the lower jaw; see pl. 10, fig. 1, pl. 15, fig. 1; and, for comparison, pl. 1, fig. 11, and pl. 2, fig. 10. Each jaw has sixteen teeth: four edged incisives in the middle, two pointed canines at the corners, and ten grinders with tuberculous crowns. The carpus has eight bones, four in each row, pl. 8, fig. 9; the tarsus has seven. Man has thirty-two vertebræ: seven cervical, twelve dorsal, five lumbar, five attached to the sacrum, and three to the coccyx. Seven pair of the ribs are united to the sternum by cartilaginous processes, and are called true ribs; the five succeeding are called false ribs.

The period of gestation is nine months. A fœtus of a month is generally an inch high; of two months, an inch and a quarter; three months, five inches; five months, six or seven inches; seven months, eleven inches; eight months, fourteen inches; and nine months, eighteen inches. Those born at seven months seldom live.

The teeth begin to appear some months after birth; at two years there are twenty, which fall successively about the seventh year, to be replaced by others. Of the twelve inmost grinders, which do not fall, there are four which appear at four years and a half, and four at nine years: the four last do not appear until from the twentieth to the twenty-sixth year. The fœtus grows quicker in proportion as its birth approaches; the child, on the contrary, grows less and less: it has more than a quarter of its height when born, a half at two years, and three quarters at nine or ten.

Mammalia in general remain for some weeks in a state of weakness; but towards the eighth or tenth day, all their senses are developed; frequently they can even follow their mother: but Man is born weaker than all others of his class; his senses require a sort of education, and do not manifest themselves until the fortieth day. Observation proves that those animals who live in society are those who are most dependent on the assistance of each other, and that the two sexes only unite when they are destined to produce offspring feeble at the moment of their birth. All animals whose young are born weak and inactive, provide beforehand for their sustenance, if they, the parents, are to die before their complete developement: thus the greater number of insects deposit their eggs in suitable places; the Necrophori in dead bodies, the Ichneumons in

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larvæ, etc. Other animals both nourish and instruct their young, in which the male and female are occupied in common, at least if there are not individuals especially destined to this employment, as amongst the Ants and Bees. Insects, Fish, Reptiles, and many others, never live in couples; whilst amongst those animals who remain feeble long after birth, the two sexes unite to share the requisite care and solicitude.

Almost all animals, by a presentiment which we may call innate, exercise, even at the moment of their birth, those movements which are necessary to supply their wants and preserve their existence. The Spiders spin their web and extend their nets, the Myrmeleon prepares its snares, the Chicken wears away its shell. All these operations are admirable, but they are not from reason; their industry is always the same; it does not become more perfect; it even seems that the more animals display instinct, the less they are gifted with reason; for if we return the chrysalid of the Bombyx (Great Peacock Butterfly) into its cod (terminated at one end by stiff converging bristles, so as to afford only a free passage outwards), with its head the contrary way, it will persist until death in its attempts to conquer the irresistible obstacle, rather than turn or go out by any lateral opening which we may make for it. The child has but very little instinct in his first age; he scarcely manifests more when he can speak: all the knowledge of man is the result of his own sensations, or those of his predecessors; transmitted by speech, matured by meditation, applied to his wants and enjoyments, they have furnished all his arts: speech and writing, by preserving the knowledge already acquired, are sources of indefinite perfection.

ORDER I.

Bimana.

GENUS. HOMO.

Although the human species appears to be unique, we may observe certain hereditary conformations which constitute what are called Races.

Three of these are eminently distinct: the White or Caucasian, the Yellow or Mongolian, the Negro or Ethiopian.

The Caucasian, to which we belong, is distinguished by the beautiful oval form of the head; it is this race which has given

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birth to the most civilized people, to those who have generally ruled over the others; it varies in complexion and the colour of the hair. *

The Mongolian is recognised by its projecting cheek bones, which are on a line with the nose; flat face, narrow and oblique eyes, straight and black hair, thin beard and olive complexion, pl. 1. It has formed the great empires of China and Japan, and has sometimes extended its conquests on this side of the Great Plain; but its civilization has always remained stationary.†

The Negro race is confined to the south of the Atlas; its complexion is black, its hair woolly; its compressed skull, flattened nose, projecting muzzle, and thick lips, evidently approach the Apes. The nations which compose it have always remained barbarous. §

We have called the race from which we descend Caucasian, because the traditions and genealogies of the people seem to carry

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* A white skin, either with a fair rosy tint, or inclining to brown; red cheeks; hair black, or of the various lighter colours, copious, soft, and generally more or less curled or waving. Irides dark in those with brown skin, light, (blue, gray, or greenish) in the fair or rosy complexioned. Large cranium with small face; the upper and anterior regions of the former particularly developed; and the latter falling perpendicularly under them. Face oval and straight, with features distinct from each other; expanded forehead, narrow and rather aquiline nose, and small mouth; front teeth of both jaws perpendicular; lips, particularly the lower, gently turned out; chin full and rounded. Moral feelings and intellectual powers most energetic, and susceptible of the highest developement and culture.—*Lawrence's Lectures.*

† The Mongolian variety is characterised by an olive colour, which in many cases is very light and black eyes; black straight, strong, and thin hair, little or no beard, head of a square form, with small and low forehead; broad and flattened face, with the features running together; the glabella flat and very broad; nose small and flat; rounded cheeks projecting externally; narrow and linear aperture of the eyelids; eyes placed very obliquely; slight projection of the skin; large ears; thick lips. The stature, particularly in the countries near the North Pole, is inferior to that of Europeans.—*Lawrence's Lectures.*

§ In the Ethiopian variety the skin and eyes are black; the hair black and woolly; the skull compressed laterally and elongated towards the front; the forehead low, narrow, and slanting; the cheek-bones are prominent; the jaws narrow and projecting; the upper front teeth oblique; the chin recedes; the eyes are prominent; the nose broad, thick, flat and confused with the extended jaw; the lips, and particularly the upper one, are thick. The knees turn in in many instances.—*Lawrence's Lectures.*

them back to the groupe of mountains situated between the Caspian and the Black Seas. The people of the Caucasus itself, the Circassians and the Georgians, are to this day considered the most beautiful in the world. We may distinguish the principal branches of this race by the analogy of their languages. The Armenian branch, or that of Syria, directed itself to the south, and produced the Assyrians, Chaldeans, the unsubdued Arabians, who once hoped to become masters of the world, the Phœnicians, the Jews, and the Abyssinians: it is very probable that the Egyptians belonged to it. It is in this branch, always inclined to mysticism, that the most extended religions have originated. Sciences and letters have sometimes flourished in it, but always under whimsical forms and a figurative style.

The Indian, German, or Pelasgic branch is much more extended, and was much more anciently divided; nevertheless we recognise numerous affinities between its four principal languages: the Sanscrit, now the sacred tongue of the Hindoos and the mother of all the languages of Hindostan; the ancient language of the Pelasgi, the mother of the Greek, of the Latin, of many extinct languages, and of all which now exist in the south of Europe; and the Gothic or Teutonic, from whence the languages of the north and north-west are derived, such as the German, Dutch, English, Danish, Swedish, and their dialects; lastly, the Sclavonic, the mother of those of the north-east, or the Russian, Polish, Bohemian, and Vendean.

It is this great and respectable branch of the Caucasian race which has carried philosophy, science, and art to the highest pitch, and has been the depository of each for thirty ages.

It was preceded in Europe by the Celts (the nations of which, originally from the north and formerly much extended, are now confined towards the most western points), and by the Cantabrians, who passed from Africa into Spain, and are now almost lost amid the numerous nations whose descendants are mingled together in that peninsula.

The ancient Persians have the same origin as the Indians, and their descendants still retain the strongest marks of affinity with the people of Europe.

The Scythian and Tartar branch, first directed to the north and north-east, always wandering in the immense plains of those countries, only returned to devastate the happier establishments of their brethren. The Scythians, who so anciently made irruptions into Upper Asia; the Parthians, who destroyed the Greek and Roman power there; the Turks, who overthrew that of the Arabs, and, in Europe, subjugated the unfortunate remains of the Greek nation,

are swarms from this branch: the Finlanders and Hungarians, who belong to it, are in some measure confounded with the Sclavonic and Teutonic nations. The north-east of the Caspian Sea, their original country, still nourishes people who have the same origin and speak similar languages; but they are intermingled with an infinity of other small nations of different origins and tongues. The Tartars remained more pure throughout the region whence they so long menaced Russia, and in which they were at last subjugated by her, that is, from the mouths of the Danube to beyond the Irtisch. The Mongolians, however, in their conquests, have mingled their blood with the Tartars, and we detect numerous traces, especially amongst the people of Little Tartary.

The Mongolian race commences to the east of this Tartar branch of the Caucasian, and rules to the Eastern Ocean; its branches, still nomadic, the Kalmucks and Kalkas, traverse the Great Plain. Three times their ancestors, under Attila, under Gengis, and under Tamerlane, spread afar the terror of their name. The Chinese were the most anciently civilized, not only of this branch but of all known people. A third branch (the Manchous) has recently conquered China, and still governs it. The Japanese, the Coreans, and almost all the hordes which extend to the north-east of Siberia, under the Russian power, also in a great part belong to it. If we except some learned Chinese, the whole of the Mongolian race follows the different sects of the worship of Fo.

The origin of this great race appears to have been in the Altaïc mountains, as ours sprung in the Caucasian; but it is not possible to follow equally well the filiation of its different branches. The history of all these wandering people is as fugitive as their colonies; and that of the Chinese, concentrated in their Empire, affords only brief and abrupt notices of the neighbouring people. The affinities of their languages are also too little known to guide us in this labyrinth.

The languages of the north of the peninsula beyond the Ganges have, as well as those of Thibet, some affinity to the Chinese, at least by their monosyllabic nature; and the people who speak them are not without resemblance to the other Mongolians in their features: but the south of this peninsula is inhabited by Malays, a much handsomer people, whose race and language are spread on the coasts of all the islands of the Indian Archipelago, and who have occupied almost all those of the South Sea. In the largest of the former islands, especially in the wildest parts of them, dwell another people with woolly hair, black complexion, and negro

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countenance, all extremely barbarous. The best known bear the name of Papoos, under which we may generalize them.

Neither these Malays or Papoos can be easily traced to either of the three great races; but can the first be clearly distinguished from their neighbours on each side of them, the Caucasian Indians and the Chinese Mongolians? We must confess that we have not yet found sufficient characters to distinguish them. Are the Papoos Negroes who have anciently wandered on the Indian Sea? We have not yet either figures or descriptions sufficiently clear to answer this question.

The inhabitants of the north of the two continents, the Samoïedes, the Laplanders, and the Esquimaux, have sprung, according to some authors, from the Mongolian race; according to others, they are but degenerate shoots of the Scythian and Tartar branch of the Caucasian.

The Americans have not yet been clearly referred to either of the races of the ancient continent; nevertheless, they have no character, at the same time sufficiently marked and constant, to make them a distinct race. Their copper complexion is not a sufficient one; their hair, generally black, and their thin beard, would refer them to the Mongolians, if their well-marked features and tolerably projecting nose did not oppose it. Their languages also are as inumerable as their nations, and we have not yet been able to detect any analogy either between these languages themselves, or between them and the languages of the Old World. *

The frozen climates to the north of the two continents, the impenetrables forests of America, are still only inhabited by savage hunters or fishermen.

The immense sandy or salt deserts in the centre of Asia and Africa are covered by shepherd people and innumerable flocks. These hordes, half civilized, assemble whenever an enthusiastic chieftain summons them, and pour upon the civilized countries which surround them, to establish and enervate themselves therein,

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* The American variety is characterised by a skin, of a more or less red tint; black, straight, and strong hair, small beard, which is generally eradicated, and a countenance and skull very similar to those of the Mongolian Tribes. The forehead is as low, the eyes deep, the face broad, particularly across the cheeks, which are prominent and rounded, yet the face is not so flattened as in the Mongols; the nose and other features being more distinct and projecting. The mouth is large, and the lips rather thick. The forehead and vertex are in some cases deformed by art.—*Lawrence's Lectures.*

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until other pastors succeed to subjugate them: this is the true cause of the despotism which has, in all ages, crushed the industry born in the beautiful climates of Persia, India and China.

Mild climates, soils naturally watered and rich in vegetables, are the true cradles of agriculture and civilization; and when their position shelters them from the irruptions of barbarians, every sort of knowledge is naturally excited. Such were, first of all, Greece and Italy in Europe; such is now almost all this happy part of the world.

There are, however, some intrinsic causes besides, which would appear to arrest the progress of certain races, even under the most favourable circumstances.

ORDER II.

Quadrumana.

Besides the anatomical details peculiar to Man, this family differs from our species by the very evident character that the hind-feet have toes free and opposable to the others, and that all the toes are long and flexible like the fingers. All the species climb trees with facility, whilst they erect themselves and walk upright with difficulty, their foot then resting on its exterior edge only, and their narrow basin being unfavourable to equilibrium. They have intestines similar to ours, their eyes directed forwards, the mammæ on the breast, the brain with three lobes on each side, the posterior of which covers the cerebellum, see pl. 3, fig. 1; the hollow of the temple separated from the orbit by a bony partition, pl. 4, fig. 3; but, otherwise, they gradually recede from our form by assuming a muzzle more and more elongated, a tail, and a walk more entirely that of a Quadruped: nevertheless, the liberty of their fore-arms, and the complicated formation of their hands, permit many actions and gestures similar to those of Man.

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Quadrumana.

GENERA.

1. Apes. (1)

4 incisive teeth to each jaw.	Always a flat nail on the great toe of the hind foot.

2. Makis. Lemur.

More or less than 4 incisives either in the upper or lower jaw, or else differently inserted to those of Apes, which are perpendicular.	A pointed nail on the second toe of the hind foot only.

(1) Their grinders have blunt tubercles like those of Man, and they live chiefly on fruit; but their canines, exceeding the other teeth, furnish them with a weapon not possessed by Man.

GENUS I. APES.

SUB-GENERA.

1. Apes proper.

20 grinders, the same number as Man.	Nostrils pierced under the nose.	Flat nails on all the fingers and toes.

2. Sapajoos, or American Apes.

24 grinders, or 36 teeth in all.	Nostrils pierced at the sides of the nose.	Ditto.

3. Wistitis. Hapale. Arctopithecus.

20 grinders.	Ditto.	Pointed nails on all the fingers and toes, except the great toe.

SUB-GENUS I. APES PROPER.

TRIBES.

1. Orangs. (1)

Facial angle 65°. Muzzle little prominent. pl. 1, fig. 5.	No cheek pouches or callosities. No tail.

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2. Guenons. Cercopithecus. Monkeys. (2)		
Facial angle 60°. Pl. 1, fig. 7.	Cheek pouches and callosities. Tail.	The last grinder having four tubercles, as the others. Pl. 3, fig. 7.
3. Baboons. Papio.		
Facial angle less than 60°. Pl. 1. fig. 9.	Cheek pouches and callosities. A tail, or a tubercle in place of it.	The last grinder in the lower jaw has an odd tubercle. Pl. 3, fig. 6. Membranous pouch adhering to the larynx.
4. Pongos. (3)		
Forehead very much sloped, face pyramidal. Pl. 4, fig. 1.	No tail.	Membranous pouch adhering to the larynx.

(1) These are the only Apes whose os hyoïdis (or tongue bone), liver, and cæcum resemble those of Man.

(2) All the Apes of the Old World which follow, have the liver divided into many lobes; the cæcum large, short, and without an appendage; and the os hyoïdis in the form of a buckler: pl. 1, fig. 22, 23. *Callosities* mean that the buttocks, instead of being covered with hair, are bare, presenting only an indurated skin. There is a large Guenon (Simia Nasica, *Schreber*) which is remarkable for an excessively long nose, in the form of a notched spatula. It is found in Borneo, and its cry is Kahaw. They assemble morning and evening, in troops, on the branches of the large tress bordering the rivers.

(3) There is but one species yet known; it is the largest of all Apes and inhabits Borneo. Its anatomy is almost as favorable to the vertical position as that of the Orang, and its height nearly equals that of Man. Wurmb first transported this animal, of which Buffon was ignorant, its name being applied by him to a large species of Orang, which sprung from his own imagination and combinations. Since M. Cuvier published the 'Règne Animal,' he has read a paper expressing his opinion that the Pongo is no other than an old Orang: The muzzles of the Apes in the Menagerie of the Jardin du Roi have been observed to prolong considerably with age, and the compression of the skull from the same cause is very obvious, in examining those of Cats and some other animals; yet it is difficult for an ordinary observer to reconcile the idea of the Orang and the Pongo being the same, when he looks at the two skeletons in the Gallery of Anatomy, the heads especially; see pl. 4, fig. 1, 2, 3. The Pongo is also known to have a membranous pouch adhering to the larynx, like the Baboons, as M. Cuvier himself observes, adding, that the elevation of the lower jaw indicates a disposition in the organs of the voice similar to that which has been discovered in the Mycetes. German naturalists remark that its arms refer it to the Hylobates of Illiger (Gibbons), and its skull to the Cercopithecus.

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Dumeril made it a distinct genus. It is said not only to erect itself on its hind legs, but to tear off the branches of the trees by force, and to defend itself vigorously against men. I am persuaded that the Ingheena of the people of Gaboon must be a Pongo *(Mission to Ashantee,* page 441), and that the large species of Orang to which Buffon applied this name, instead of being "the imaginary product of his own combinations," as M. Cuvier conceives, was described by him after some imperfect accounts of that extraordinary animal which had reached Europe. Empoongwa, that native name of the country in which it is most common, was corrupted into *Pongo* in all the maps which preceded mine, being so written by Leyden, Cuny, and other African geographers; and this is the true origin of Buffon's name, in my opinion (as indicating the *habitat* of the animal), and not *boggo*, a reported African name for mandrill, of which M. Cuvier has concluded *Pongo* to be a corruption.—*Règne Animal,* t. 1, p. 111, note 2.

TRIBE I. ORANGS.

DIVISIONS.

1. Satyrus.

Forehead. Pl. 4, fig. 2.	Arms long enough to reach the ground, even when standing upright. Pl. 6.

2. Troglodytes.

No forehead. Pl. 4, fig. 3.	Arms to the knees only. Pl. 7. fig. 1. (1)

(1) Camper discovered and described two membranous bags which communicate with the ventricles of the glottis of the Orang Outang (Simia Satyrus), and deaden or obstruct the voice. The intelligence of this animal has been exaggerated; it very little surpasses that of the Dog. It only inhabits the most eastern countries, as Malacca, Cochinchina, and Borneo. The Gibbons belong to the first division of Orangs. The Chimpanzee (Simia Troglodytes) is said to be found in Guinea and and Congo. I had one in my possession for some time when in Gaboon: its cry (on being held before the cage of a Panther) was like that of a very feeble old man; whom it also resembled in all its ordinary actions and movements, although in the vigour of youth.

TRIBE III. BABOONS.

DIVISIONS.

1. Magots. (1)

Muzzle thick, and moderately long.	A small tubercle instead of a tail.

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2. Macaucos. (2)

Nostrils oblique to the upper surface of the muzzle. Pl. 3, fig. 13. — A tail.

3. Cynocephalus.

Muzzle elongated, and truncated at the end. Pl. 3, fig. 14. — A tail.

4. Mandrills. (3)

The longest muzzles of all the Apes, the facial angle being only 30°. Pl. 1, fig. 8. — A tail.

(1) The Magot (Simia Sylvanus, Pithecus, et Inuus) sometimes breeds in France, and is naturalized in the least accessible parts of the rock of Gibraltar. M. de Blainville has discovered that it is the anatomy of a Magot which is given by Galien, and not that of the Orang as Camper had concluded.

(2) The distinction of the nostrils is, that in the Macaucos their direction is such as to form an acute angle with the face, in the Cynocephalus an obtuse angle: see pl. 3, fig. 13, 14. M. Cuvier says, that Macaco is the generic name of Apes on the Coast of Guinea, and just before (Règne Animal, p. 107) that Douc or Dok means Ape in Cochinchina. I imagine that he may have reversed the names, inadvertently, for that of Macaco is unknown on the Coast of Guinea, whereas Dokoo signifies Ape or Monkey there.

(3) There is but one species (Simia Maimon and Mormon, *Lin.* Boggo and Choras of Buffon); the Negroes of Guinea are said to hold it in great dread, and many traits of its history have been confounded with that of the Chimpanzee, and Eastern Orang. M. Cuvier, as well as M. Geoffroy, has observed the progressive change of two or three Mandrills or Maimons into Choras or Mormons, in the menagerie of the Museum; the adult male assuming the red nose which has given rise to the belief of there being a second species.

SUB-GENUS II. SAPAJOOS.

TRIBES.

1. Sapajoos proper. Cebus.

Tail prehensile, not tufted.

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2. Sakis.

Tail not prehensile, tufted.

(1) All the large Quadrumana of the New Continent belong to this division; their large intestines are less bloated, and their cæcum longer and more slender than that of the preceding. Prehensile tails are those which may be twisted with sufficient force around objects, to hold by them, or to seize them as with a hand. This part of the tail is naked and callous underneath.

TRIBE I. SAPAJOOS PROPER.

DIVISIONS.

1. Mycetes. Howling Apes. (1)

Prehensile tail.	Head pyramidal. Pl. 1, fig, 10.	Thumbs distinct.

2. Ateles. (2)

Prehensile tail.	Head very flat.	Thumbs hid under the skin.

3. Cebus. (3)

Tail entirely covered.	ditto.	Thumbs distinct.

(1) The Mycetes are distinguished by their pyramidal head; the upper jaw descends much lower than the skull, the branches of the lower being much elevated, see pl. 1, fig. 10; in the other genera they are both nearly in the same horizontal line. This diposition of the jaw is to make room for what M. Cuvier calls a bony drum, formed by a vesicular enlargement of the os hyoïdis or tongue bone, pl. 1, fig. 24, which communicates with the larynx, and being filled with air by the vibrations of the glottis, gives the voice that enormous volume of frightful sound which characterises this animal. Humboldt heard its cry at a distance of 800 toises by measurement, and it is said to be audible more than a mile off.

(2) One species, however, the Chamek (Ateles Pentadactylus, Geoff.) differs from the others in having one joint only of the thumb projecting, and without a nail. Its lower jaw is almost as high as that of the Mycetes, and the os hyoïdis similar to theirs. All the animals of this and the preceding family come from Guyana and Brasil. Their fore feet are exceeding long and thin, and they walk very slow. They present some remarkable resemblances to Man in the muscles, and are the only animals who have the biceps of the thigh the same as ours.

(3) The animals of this family come from South America, and their movements are quick and lively. They are called Weeping Apes, from their plaintive cry.

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GENUS II. MAKIS OR LEMUR.

SUB-GENERA.

1. MAKIS PROPER. FOX-HEADED APES. (1)		
6 incisives below, projecting; 4 above, straight.	A long tail.	
2. INDRIS. LICHANOTUS. (2)		
4 incisives below, 4 above.	No tail.	
3. LORIS. STENOPS. TARDIGRADUS. (3)		
4 incisives below, 4 above. Pl. 3, fig. 12.	Ditto.	
4. GALAGO. OTOLICNUS (4)		
6 incisives below, 4 above.	Long tail, tufted.	Elongated tarsi to the hind feet, which are consequently disproportionate.
5. TARSIUS. (5)		
4 incisives above, 2 below, and several canine teeth between the incisives and grinders.	Ditto.	Do. do. Pl. 4. fig. 10.

(1) The Makis appear to take the place of Apes in the island of Madagascar, none of the latter being found there.

(2) Only one species is known (Lemur Indris, *Sonnerat.*), which the inhabitants of Madagascar tame and train to the chase like dogs.

(3) Their grinders have sharpish points instead of tubercles; and they sometimes eat small birds and quadrupeds. Mr. Carlisle has found the same ramifying divisions at the base of the arteries of the members of the Loris, whose movements are excessively slow, as in the Sloth.

(4) I could not find the skeleton of a Galago in the Gallery here; according to the German Zoologists they have the tarsi still longer in proportion than those of the Tarsii, so as considerably to exceed even the length of the tibia. Illiger in his classification makes the tarsi of the Tarsii longer than the tibiæ, but this is evidently an error; others of his countrymen write, that the proportion of the tarsus to the tibia is not

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near so great in the Tarsii as in the Galago's; see the tarsus of a Tarsius compared with that of a Lori, pl. 4, fig 9, 10. *a*.

(5) Illiger appears, however, to have followed a more natural order than Cuvier in placing the Tarsii before the Otolicni or Galago's, as they are nearer to the Lori's both by the less disproportionate length of their tarsi, and by their teeth also, if what the German Zoologists assert be true, that the Otolicnus has only two teeth above, and not the same number as the Maki's, as affirmed by M. Cuvier.

M. Cuvier remarks, that travellers should look for a new Genus or Sub-genus of animals drawn by Commerson, the traveller in the African Islands. I add the following abridgment of Geoffroy's description in the 'Ann. de Mus.' ix, x. for their guidance.

These animals are like cats, with round heads, nose and muzzle short, lips furnished with mustachios, large eyes, (projecting and near together), ears short and oval. Tail long, hairy, regularly cylindrical, coming to the front, naturally rolling round, sometimes back on itself, and sometimes encircling the body. These traces of the family of Felis are combined with fingers as deeply divided and fit for prehension as those of the Maki's; a thumb on each hand, wide apart, separate, and capable of distinct movements; a large, short, flattened nail on the thumbs; the other nails narrow, thin, sharp, and greatly surpassing the last joint. They appear to form a link between the Maki's and Sarcophaga, as the Gallopitheci lead from the Maki's to the Bats, and the Aye Aye's to the Rodentia. The following names have been given them:—

Cheirogaleus Major, 11 inches high, brownish colour, particularly towards the forehead.
— Medius, 8 inches and a half, colours less deep, a black circle round the eyes, and the forehead light.
— Minor, 7 inches, colours light, a black circle round the eyes, and the forehead also light.

It is suspected that Pennant knew the latter; he said he saw a living Lemur which had a round head, which he took for the little Macauco of Brown, and which he also approached to the Madagascar Rat of the *Supplemens de Buffon*. He adds, that this animal was 7 inches long, and his description, as far as it goes, answers to that above.

ORDER III.

Sarcophaga.

These animals form a considerable and varied assemblage of Quadrupeds with nails, which, like the Quadrumana, possess the three kinds of teeth. They all live on animal food, the more or

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less entirely, as their grinders are more or less edged or cutting: those with grinders entirely or partly tuberculous eat more or less vegetable substance: insects form the principal nourishment of those whose grinders are armed with conical points. The transverse articulation of their lower jaw does not admit of any horizontal movement, it can only open and shut. Pl. 3, fig. 2.

Their brain has no third lobe, and does not cover the cerebellum any more than that of the following families; their orbit is not separated from the hollow of the temple in the skeleton. Their skull is compressed, and their zygomatic arch, (formed by the jugal in its passage to the temporal), projecting and elevated, gives more space and force to the muscles of their jaws. Their strongest sense is smell, and their pituitary membrane is generally extended over a multiplicity of bony plates: the fore-arm turns, though with not so much facility as in the Quadrumana, and the great toes of their fore-feet are never opposable to the others. Their intestines are less voluminous, on account of the substantial nature of their food, and to avoid the putrefaction which the flesh would undergo if it staid too long in an elongated canal. Their forms and the details of their organization vary considerably, and produce analogous varieties in their habits to such a degree that it is impossible to range their Genera in the same line, and we are compelled to form several Families which are variously linked to each other by a multiplicity of affinities.

Sarcophaga.

FAMILIES.

1. Cheiroptera. (1) A fold of skin, extended between the fore feet and toes, sustains them in the air, and sometimes permits flight.	Mammæ on the breast.	Grinders armed with sharp points. Pl. 4, fig. 14.
2. Insectivora. (2) No lateral membranes.	. . . . . Mammæ under the belly.	Feet short, movements feeble.
3. Carnivora. (3) 2 large long canines, with 6 incisives between, to each jaw.		Grinders either entirely edged, or parts only, with blunt tubercles.

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4. Didelphis, *Lin.* (4)

2 distinct bones attached to the pubis, and placed between the muscles of the abdomen, in the male as well as the females, even when the pouch is scarcely evident. Pl. 5, fig. 16.	The skin of the abdomen almost always forming a pouch around the mammæ.	Separate great toes on the hind feet, but without nails.

(1) This formation requires strong clavicles, and large scapulæ, that the shoulder may be sufficiently solid; but it is incompatible with the rotation of the fore arm, which would weaken the force of the shock necessary for flight. They have all four large canines, but the number of their incisives varies. Penis pendens.

(2) The Insectivora lead a nocturnal or subterranean life; they feed principally on insects; and, in cold countries, many of them pass the winter in torpidity: none of them have any cæcum. They rest the entire sole of the foot on the ground when walking. Penis in theca.

(3) Many of the Sarcophaga, and especially those of the two preceding Families, are compelled to live chiefly on insects, from the weakness and the conical tubercles of their grinders. In this Family the sanguinary appetite is joined to the force requisite to gratify it. They always have four long and large canine teeth, wide apart, between which are six incisives in each jaw. We may almost calculate the proportion of their diet by the extent of the tuberculous surface of their teeth, compared with the cutting part. The Bear, which is able to nourish itself entirely with vegetables, has almost all its teeth tuberculous. The anterior grinders are the sharpest; a grinder larger than the others follows, which generally has a tuberculous heel, more or less wide within, and behind it we find one or two small teeth entirely flat. See pl. 5, fig. 1, and pl. 4, fig. 18, 19. It is with these little teeth at the back of the mouth, that dogs masticate the grass which they sometimes swallow. The large grinder above, and the corresponding one below, are called *carnivorous teeth;* the pointed anterior, *false grinders;* and the blunt posterior, *tuberculous teeth.* It will be readily imagined, that those Genera which have fewest grinders, and whose jaws are the shortest, bite with most force. Several Genera, like all those of the two preceding Families, put the entire sole of the hind foot to the ground when walking, or when they stand upright, which is obvious from the want of hair on the whole of this part. The greater number of Genera only walk on the ends of their toes, raising the whole of the tarsus: their course is more rapid, and to this difference they add many others in their habits, and even in their interior formation. They have only a bony rudiment suspended in the flesh, instead of a clavicle.

(4) They are characterised by the premature birth of their young, which are born incapable of movement, and almost without limbs and

exterior organs. M. Cuvier says " that this premature birth is in con-" sequence of the peculiar organisation of the matrix, which, instead " of opening by a single orifice in the depth of the vagina, communi-" cates with it by two lateral tubes." Of course, therefore, the fœtus must pass through these tubes to the vagina in a very early stage of its existence, or else it would become too large to do so. Solæ huic familiæ Inter mammalia, nullâ exceptâ, scrotum ante penem pendens commune est.

FAMILY I. CHEIROPTERA.

GENERA.

1. Vespertilio. Bats.

Arms, fore arms, and fingers, excessively elongated, and forming wings with the membrane which fills up the intervals. Thumb short, armed with a crooked nail. (1) Pl. 7, fig. 7.	Hind feet weak, divided into five equal toes, all furnished with nails.

2. Galeopithecus. Flying Lemur.

Fingers (all furnished with sharp nails) not longer than the toes. (2) Pl. 7, fig. 2.	Canine teeth dentated (Pl. 7, fig. 5), and as short as the grinders. 2 dentated incisives above, wide apart; 6 below, divided into long slits, like the teeth of a fine comb. Pl. 7, fig. 4.

(1) Bats fly very high and rapidly. Their pectoral muscles are of a thickness proportioned to the movements they are destined to execute, and their sternum has an edge or carina in the middle (to which these muscles are attached) like that of birds. They have no cæcum. Their eyes are exceedingly small, but their ears are often very large, and, with their wings, form an enormous membranous surface, almost naked, and so sensible that bats direct themselves to every corner of their labyrinth, even after their eyes have been taken out; probably merely from the difference of the impressions made by the air. They are nocturnal animals, and in our climates pass the winter in torpidity: they suspend themselves in obscure places during the day. They generally bear two young ones, which they carry clinging to their breasts, and whose size is considerable in proportion to that of their mother.

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(2) The membrane which occupies the spaces between the fingers, and extends as far as the sides of the tail, can scarcely perform the functions of a parachute. These animals live on the trees in the Indian Archipelago, and pursue insects, and perhaps birds: it is supposed, from the detrition which their teeth undergo with age, that they must also feed on fruits. They have all a large cæcum. We know but one species. Pl. 7, fig. 2.

GENUS I. VESPERTILIO.

DIVISIONS.

1. Pteropus. (1) Ternate Bats. Roussets.		
4 sharp incisives in each jaw. The fore finger, one half shorter than the middle, bears a third joint, and a small nail. Pl. 7, fig. 3.	The membrane deeply sloped between the legs.	Grinders with flat tops, or two longitudinal ridges worn down by use. Pl. 7, fig. 10.
Subdivided into. § 1, without tails. § 2, with tails.		
2. Cephalotes. (2)		
First finger short, and like that of the Pteropus, but without a nail.	Interfemoral membrane sloped between the legs, as in the Pteropus; but the membranes of the wings, instead of joining the flanks, united to each other in the middle of the back, to which they adhere.	Grinders with flat tops.
3. Vespertilio proper. Common Bats.		
No nail on the fore finger.	Membrane always extended between the legs, with the exception of one Sub-genus.	Grinders armed with conical points.

(1) They live chiefly on fruits, but they know how to pursue birds and small quadrupeds. They are the largest of all Bats, and their flesh is eaten: they inhabit the East Indies. One of these, gray and woolly, (Pter. Ægyptiacus) lives in subterraneous places in Egypt.

(2) These are all Insectivora.

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DIVISION I. PTEROPUS.

TRIBES.

1.

3 joints to the middle finger, the others having but two.

2.

Fore finger only 1 joint, the others 2.

TRIBE I.

SUB-GENERA.

1. Molossus.		
2 incisives in each jaw.	Tail as long, and frequently longer than the interfemoral membrane.	Wide short ears, uniting on the muzzle. Tragus short, and not enveloped by the conch. Muzzle simple. Pl. 7, fig. 7.
2. Nyctinoma.		
4 incisives below.	Ditto.	Upper lip high and much sloped. Pl. 7, fig. 6.
3. Stenoderma.		
2 incisives above, and 4 below.	No tail.	Interfemoral membrane sloped away as far as the coccyx. Pl. 8, fig. 1.
4. Noctilio.		
4 incisives above, and 2 below.	Tail short, and free from the interfemoral membrane.	Ears separate. Muzzle short, swelled, cleft, furnished with warts and rough furrows. Pl. 8, fig. 2.

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5. Phyllostoma. (1)

4 incisives in each jaw, but those below are often pushed out by by the growth of the canines.	A membrane in the form of a leaf across the end of the nose. Tongue has the power of elongating, and is covered with tubercles.	The tragus of the ear more or less like a dentated leaf. Tubercles symmetrically arranged round the lips. Pl. 8, fig. 3.

Subdivided into

§ 1, without a tail.	The membrane of the nose hollowed like a funnel.
§ 2, a tail connected with the interfemoral membrane.	The membrane of the nose like the head of a lance, with *smooth* edges.
§ 3, tail free above the interfemoral membrane.	The membrane of the nose like the head of a lance, with *dentated* edges.

(1) They are all from America, run on the ground better than other Bats, and are accustomed to suck the blood of animals. The Vampire, which belongs to this Subgenus or Division, has been accused of killing men and animals by sucking their blood; but it confines itself to making very small wounds, which may sometimes be envenomed by the climate.

TRIBE II.

SUB-GENERA.

1. Megaderma.

4 incisors below, none above; intermaxillary bone remains cartilaginous.	Very complicated membrane on the nose. Tongue and lips smooth. Interfemoral membrane entire. No tail.	The tragus large, often forked; conchs of the ears very large, and joining each other on the top of the head. Pl. 8, fig. 6.

2. Rhinolophus.

4 incisives below, and 2 very small above, in a cartilaginous intermaxillary bone.	Nasal membrane and crest very complicated, lying on the forehead like a horse-shoe. Pl. 8, fig. 5.	Tail long, in the interfemoral membrane.

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3. Nycteris. (1)		
4 incisives above, without intervals, and 6 below.	The forehead hollowed into a small furrow, evident in the skull; nostrils encircled by projecting scales. Pl. 8, fig. 4.	Ears large, not united. Tail in the interfemoral membrane.
4. Rhynopoma. (2)		
	A small scale above the nostrils, furrow in the forehead less marked. Pl. 7, fig. 8.	Ears united. Tail much surpassing the membrane.
5. Thaphozous. (3)		
2 incisives above, and 4 below.	No scale upon the nostrils.	Ears wide apart, and tail free above the membrane.
6. Vespertilio communis. (4)		
4 incisives above, the 2 middle wide apart; 6 below, a little dentated.	No membrane on the muzzle.	Ears separate; tail compressed in the membrane.
7. Plecotus. (5)		
		Ears, considerably larger than the head, united upon the skull. Pl. 7, fig. 9.

(1) These are from Africa. Daubenton has described one of them, (the V. Hispidus of *Lin.*). M. Geoffroy found others in Egypt.

(2) One of these is known in Egypt, where it chiefly frequents the pyramids.

(3) M. Geoffroy discovered a species in the catacombs of Egypt.

(4) There are six or seven species in France; they are the most numerous of all the Bats.

(5) The common species (Vesp. Auritus, *Lin.*) is still more common in France than any of the former. Its ears almost equal its body.

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FAMILY II. INSECTIVORA.

GROUPES.

1.

2 long incisives in front, followed by other incisives and canines, all shorter than the grinders. Pl. 4, fig. 13.

2.

4 long canines wide apart, with small incisives between.

GROUPE I.

GENERA.

1. Erinaceus. (1) Hedge Hog.

The 2 middle superior incisives wide apart, and cylindrical. Pl. 4, fig. 13.	Body covered with prickles instead of hairs. Roll themselves up.	Tail very short; 5 toes upon each foot.

2. Sorex. (2) Shrew.

The 2 superior middle incisives crooked, and dentated at the base. Pl. 4, fig. 15.	Body covered with hairs instead of prickles.	

3. Mygale. (3) Desman. Musk Shrew.

2 very small teeth placed between the 2 large incisives below. Pl. 4, fig. 17. The 2 superior incisives triangular, and flattened. Pl. 4, fig. 16.	Muzzle elongated into a small and very flexible trunk, which they agitate incessantly.	Tail long, scaly, and flattened at the sides. Toes united by the membranes.

4. Scalops. (4)

Teeth as Mygale.	Muzzle simply pointed as that of the Sorex.	Large paws, armed with strong nails.

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5. Chrysochloris. (5)

Teeth as Mygale.	Muzzle short, wide, and turned up.	Fore feet only 3 nails, diminishing in size from the exterior one; the hind feet 5 nails.

(1) The skin of their back is furnished with muscles, so that the animal, by bending its head and paws towards the belly, rolls itself up as if in a purse, and presents its prickles on all sides to its enemy. Pallas has remarked, that Hedgehogs eat hundreds of Cantharides without suffering from them, whilst even one gives cats and dogs the most horrible torments. The skin of one species is used for carding hemp.

(2) We find under the common hair of each flank, a small band of stiff close bristles, between which exudes a strong smelling humour, produced by a particular gland. They live in holes which they hollow in the earth, and scarcely go out of them except towards evening: they feed on worms and insects. It is not true that the bite of the common species causes sickness in horses; this report perhaps proceeds from the fact that cats readily kill, but will not eat them, on account of their smell.

(3) These are also aquatic animals; their eyes are very small, and they have no exterior ears. Castor Moschatus, *Lin.* or Muscovy Musk Rat.

(4) Their paws are formed for digging, like those of Moles, and their manner of life is the same. Sorex Aquaticus, *Lin.*

(5) These are also subterraneous animals, and their fore arm is supported, for digging, by a third bone placed under the cubitus. Talpa Asiatica, *Lin.*

GROUPE II.

GENERA.

1. Centenes. (1) Tanrec. Tendrac.

Muzzle very pointed.	Body covered with prickles like the Hedgehog, but they cannot roll themselves entirely into a ball.	No tail.

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2. Talpa. (2) Mole.

6 incisives above, 4 below.	Very short arm. Eye very small, and hid in the skin.	Paws very wide, the under part always turned outwards or backwards. Nails long, strong, flat, and sharp.

(1) Three species are found in Madagascar, one of which (Trinaceus ecaudatus, *Lin.*) has been naturalised in the Isle of France. They are nocturnal animals, and pass three months of the year in lethargy, although inhabitants of a warm climate. Bruguière even assures us, that it is during the greatest heat that they sleep.

(2) The arm is attached by a long shoulder blade, supported by a vigorous clavicle, furnished with enormous muscles: its paw or hand is sharp at its lower edge, and the fingers are scarcely to be distinguished. Its sternum, like that of birds and bats, has a carina which admits of the pectoral muscles being a sufficient size to perform their functions. To pierce through the earth and throw it up, the mole makes use of its long pointed head, the muzzle of which is armed at the end with a peculiar small bone; its cervical muscles are extremely vigorous. The cervical ligament ossifies entirely. The hinder parts are weak, and the animal moves with as much difficulty on the surface of the earth, as it does with quickness underneath it. Its hearing is very quick, and the tympanum very large, although the external ear is wanting; but its eye is so small, and so hidden by the hair, that its existence was long denied. Its jaws are weak, and its nourishment consists of insects, worms, and some soft roots. *Talpa Europea. Talpa cristata.*

FAMILY III. CARNIVORA.

GROUPES.

1. Plantigrada. (1)

The whole sole of the foot put to the ground when walking, evident from its being entirely destitute of hair underneath.	5 toes to all their feet.

2. Digitigrada. (2)

The ends of the toes, only, used in walking.	Long bodies and short feet.

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3. Amphibia. (3)

Feet so short and enveloped in skin, that they can only creep on land. Pl. 9, fig. 13.	The intervals of the fingers filled up with membranes, so as to make excellent oars.

(1) They participate in the indolence and nocturnal life of the Insectivora, and also want the cæcum: the greater number of those in cold countries pass the winter in lethargy.

(2) Like all the preceding, they want the cæcum; but do not pass the winter in lethargy. Although small and weak they are very fierce, and live chiefly on blood. Linnæus makes but one Genus of them.

(3) These animals pass the greatest part of their life in the sea, and only come to land to bask in the sun and suckle their young. Their long bodies, their moveable spine, provided with muscles which bend it with force, their narrow basin, their thick even fur, close to the skin, all contribute to make them good swimmers, and the details of their anatomy confirm these more evident characters.

GROUPE I. PLANTIGRADA.

GENERA.

1. Ursus. (1) Bear.	
3 large grinders on each side of both jaws, entirely tuberculous, the last the largest; before these, a pointed grinder, (making 4 in all); and between this and the canine 1 or 2 very small simple teeth, wide apart, which often fall. Pl. 5, fig. 13. Pl. 11, fig. 5, 6, 7.	Very short tail.
2. Procyon. (2) Raccoon.	
3 tuberculous grinders, and 3 pointed grinders before them. Pl. 5. fig. 19, 20.	Long tail.

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3. Nasua. Coati.		
Teeth and feeble walk of the Procyon, but an elongated and moveable nose.	Feet half palmated.(3)	Long tail.
4. Cercoleptes. Potto. Kinkajous. (4)		
2 pointed grinders before, and 3 tuberculous grinders behind.	Short muzzle, a thin and extensible tongue.	Long and prehensile tail.
5. Meles. Badger. (5)		
1 small tooth behind the canine, 2 pointed grinders, and 1 flat tuberculous tooth, which is the largest of all; the last tooth very small in the lower jaw. Pl. 5. fig. 22. A carnivorous tooth in the upper jaw.	Toes very much within the skin. Front nails very long.	Tail short. A pocket situated under the tail, whence a greasy fœtid humour issues.
6. Gulo. (6) Wolverine. Glutton.		
3 false grinders above and 4 below, before the carnivorous tooth; one small tuberculous tooth behind it. Pl. 4, fig. 18, 19.		Tail moderate; a fold of skin in place of the pocket.

(1) The cartilage of their nose is prolonged and moveable. They hollow out caves, or construct cabins, where they pass the winter in a torpor more or less profound, and without taking nourishment. In this retreat the female brings forth.

(2) Their exterior, with the exception of the tail, represents a bear in miniature. They only rest upon the entire sole of the foot when they stand still, and raise the heel when walking. Ursus Lotor, *Lin.*

(3) Nevertheless they climb trees. Their long nails enable them to dig up the ground; they come from the warm parts of America, and nourish themselves nearly in the same manner as Martins: their life is nocturnal. Vivera Nasua, *Lin.* or Brazilian Weasel.

(4) There is but one species known, (Vivera Caudivolvula, *Gm.*) from the warm parts of America, and some of the Great Carribbee Islands, where it is called Poto. It is as large as a Pole Cat, with

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woolly hair of a gray or yellowish brown, nocturnal, of a tolerably gentle nature, and lives on fruits, honey, milk, blood, etc.

(5) These are animals with a creeping walk, and a nocturnal life, like all the preceding. Ursus Meles, *Lin.*

(6) These were placed in the Genus Ursus by Linnæus, but they approach nearer to the Martins by their teeth, as well as by their nature, and only resemble the Bears in their walk: they are somewhat similar to the Badger in their appearance. Ursus Gulo, *Lin.* Ursus Luscus, *Lin.* Viverra Vittata, *Lin.* Mustela Barbara, *Lin.*

GROUPE II. DIGITIGRADA.

DIVISIONS.

1. Mustela. Vermiforma. (1) Only one tuberculous tooth behind the carnivorous tooth of the upper jaw.	Long body. Short feet.
2. Canis and Viverra. (2) Two flat tuberculous teeth behind the upper carnivorous tooth, which has a tolerably large heel.	
3. Felis and Hyæna. (3) No small teeth behind the lower large grinder.	

(1) These animals have been called vermiform, from the length of their bodies and the shortness of their feet, which allow them to pass through the smallest apertures.

(2) They are all carnivorous, but without shewing a courage proportionate to their strength, and frequently live on carrion. They all have a small cæcum.

(3) This division contains the fiercest and most voracious animals of the whole class.

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DIVISION I. MUSTELA.

GENERA.

1. Putorius. (1) Polecat. Foumart.		
2 false grinders above, 3 . . . . . below.	Lower carnivorous tooth has no interior tubercle. Upper tuberculous tooth wider than it is long.	
2. Mustela proper. Martin and Weazel.		
3 false grinders above, 4 . . . . . below.	A small interior tubercle to their lower carnivorous tooth. (2)	
3. Mephitis. (3) Skunk. Mouffettes.		
2 false grinders above, 3 . . . . . below. Inferior carnivorous tooth has two tubercles on its inner side.	Upper tuberculous tooth very large, and as long as wide.	
4. Lutra. (4) Otter.		
3 false grinders above, 3 . . . . . below.	A strong heel to the upper carnivorous tooth, a tubercle on the inner side of the lower, and a large tuberculous tooth almost as broad as it is long.	Feet palmated, and tail flattened horizontally. Head compressed.

(1) We may recognise them by their exterior, having a shorter and thicker muzzle than the Martins. They all emit a disagreeable odour.

(2) These two peculiarities in their teeth somewhat diminish the cruelty of their nature. The chace of the Mustela Zibellina, so celebrated for its rich fur, which takes place in the middle of winter, amongst frightful snows, is one of the most difficult known. In searching for these animals, the eastern countries of Siberia were discovered. North America also produces several Martins, which are indicated by travellers and naturalists under the badly determined

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names Pekan, Vison, Mink, Foutereau, etc. The two we have seen have hair under their toes.

(3) The Mephitis, like the Badger, has long nails before, fit for digging; the resemblance even extends to the distribution of its colours. The whole of this Family is remarkable for its disagreeable smell, but that of the Mephitis is more offensive than any of the others. It is generally striped with white on a black ground. All those which come from America have a long and tufted tail, but M. Léchenaud has lately brought one from Java which has no tail.

(4) These are aquatic animals, and feed on fish.

DIVISION II. CANIS AND VIVERRA.

GENERA.

1. Canis. Lupus. (1)		
3 false grinders above, 4 below, 2 tuberculous teeth behind each carnivorous tooth. The first of the upper tuberculous teeth very large; the upper carnivorous tooth has only *one* small tubercle within, but the lower has its posterior point entirely tuberculous.	Tongue smooth.	5 toes on the fore feet; 4 on the hind feet.
2. Viverra.		
Grinders as Canis, the anterior lower ones sometimes fall. 2 pretty large tuberculous teeth above, only 1 below. 2 projecting tubercles on the inner side of the lower carnivorous tooth.	Tongue prickly and rough. A pocket more or less deep near the anus.	Nails half raised when walking.

(1) The Dog is distinguished by its curved tail, and varies to infinity in size, form, colour, and the quality of his hair. It is the most complete, the most extraordinary, and the most useful conquest made by Man; every species has become his property, each individual is devoted to his master, learns his habits, knows and defends his property, attaches himself to him until death; and all this proceeds neither from necessity nor constraint, but solely from gratitude and

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true friendship. The swiftness, strength, and smell of the Dog have made him a powerful ally of Man against other animals, and perhaps a necessary one for the establishment of society. It is the only animal which has followed Man throughout the world.

Some naturalists think that the Dog is a Wolf, others a tamed Jackal. Dogs which have again become savage in desert islands neither resemble the one or the other. Wild Dogs, and those of half-civilised people, such as the inhabitants of New Holland, have straight ears, which has caused the belief that the European species nearest the first type are our Shepherd-dog and Wolf-dog, but the comparison of their skulls brings the Irish Greyhound and the Danish Dog the nearest; after which come the old English Hound, the Harrier, and the Beagle, which only differ from each other in size and the proportion of the limbs. The Greyhound is more slender, his frontal sinus or cells smaller, and his smell weaker. The Shepherd and Wolf-dog assume the straight ears of wild Dogs, but with a greater developement of brain, which still increases, as well as sagacity, in the Water-dog and Spaniel. The Mastiff is remarkable for the shortness and strength of his jaws. The House-dogs, Spaniels, Lap-dogs, etc. are degenerated breeds, and the strongest evidences of the power of Man over Nature.

The Dog is born with his eyes closed; they open on the tenth or twelfth day; his teeth begin to change the fourth month, and he ceases to grow at two years. The female goes with young sixty-three days, and produces from six to twelve. The Dog is old at fifteen years, and scarcely ever exceeds twenty.

The Wolf (Canis Lupus, *Lin.*) is found from Egypt to Lapland, and appears to have passed into America. Towards the north, his hair becomes white in winter. He attacks all our animals, yet his courage is not in proportion to his strength. He often feeds on carrion, and his habits and physical developement have many affinities with those of the Dog.

The Black Wolf (Canis Lycaon, *Lin.*) also inhabits Europe, and although rarely, has even been found in France. His hair is of a deep and uniform black. It is said to be more ferocious than the common Wolf.

The Red Wolf, (Canis Mèxicanus, *Lin.*) of a beautiful cinamon red, with a short black mane along the whole length of the spine, is from the marshes of all the warm and temperate parts of America.

The Jackal or Golden Wolf (Canis Aureus, *Lin.*), a little less than the three preceding, dwells in troops throughout the greater part of Asia and Africa, from India and the neighbourhood of the Caspian Sea as far as Guinea. It is a voracious animal, which hunts in the same manner as the Dog, and appears to resemble it much more than any other savage species, in its formation, and the facility with which it is tamed.

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GENUS I. CANIS.

SUB-GENERA.

1. Vulpes. (1) Fox.

Pointed muzzle. Nocturnal pupils. Long and tufted tail.

(1) Foxes may be distinguished from the Dog and the Wolf, by a longer and more tufted tail, by a more pointed muzzle, by nocturnal pupils (which have the power of enlarging more than others, to receive a greater number of rays during the night), and by the upper incisives being less sloped. They emit a fœtid smell, live in holes, and only attack weak animals. The Fennek of Bruce, which Gmelin has called Canis Cerdo, and Illiger, Megalotis, is too little known for us to class it. It is a small animal of Africa, the ears of which almost equal the size of the body; it climbs trees, but neither its teeth or toes have been described.

GENUS II. VIVERRA.

SUB-GENERA.

1. Viverra proper. (1) Civets.

Pocket deep, divided into two bags.

2. Genetta. (2) Genet.

The pocket only a slight hollow, formed by a projection of the glands.

3. Herpestes. Mangoustes. (3) Ichneumon.

The pocket voluminous and simple; the anus within the pocket.

4. Ryzæna. Suricate. (4)

The pocket within the anus. Only 4 toes on each foot.

(1) The pocket, situated between the anus and organs of generation, is filled abundantly with a pomatum, strongly smelling of musk.

(2) The pocket scarcely presents a sensible excretion, though it has a very decided smell.

(3) The Mangouste of Egypt, so celebrated under the name of Ichneumon, chiefly searches for the eggs of crocodiles, but also feeds on all sorts of small animals; when domesticated it hunts mice, reptiles, etc. The Europeans of Cairo call it Pharoah's Rat, but the people of the country Nems. The tale told by the ancients, of its entering within the bodies of Crocodiles to kill them, is fabulous. The Mangouste of India is celebrated for its combats with the most dangerous serpents, and from having made known the virtue of the Ophiorhiza Mongos as an antidote to their bite.

(4) They resemble the Herpestes, even to the tints and transverse stripes of the skin. We know but one species, originally from Africa.

DIVISION III. FELIS AND HYÆNA.

GENERA.

1. Hyæna. (1)

3 false grinders above, 4 below, all conical and blunt, and two of them singularly large. Upper carnivorous tooth has a small tubercle within; but the lower none, and only presenting 2 strong sharp points. Pl. 5, fig. 1.	Tongue rough. A deep and glandulous pocket under the anus.	4 toes on each foot.

2. Felis, *Lin.* (2)

Muzzle short and round. Jaws short; 2 false grinders above, 2 below; upper carnivorous tooth with 3 lobes, and a blunt heel within; the lower, 2 lobes, pointed and sharp, without any heel; 1 very small upper tuberculous tooth above, none below. Pl. 15, fig. 2, 3, 5, 6, 7.	Nails retractile, turning upwards, hid under the fingers when reposing.	

(1) M. Cuvier says, that the upper and lower false grinders of the Hyæna are all singularly large; this is incorrect, for the first, or that following the canine, is very small, although the two others answer to

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his description. See the upper jaw of a Hyæna, pl. 5, fig. 1, which was drawn as a medium, after examining three or four others in the Gallery of Anatomy. Hyænas are voracious nocturnal animals, chiefly living upon dead bodies, seeking them even in their graves, and of which there are an infinity of superstitious traditions. We know two species, the striped, which inhabits from India even to Abyssinia and Senegal; and the spotted, from the south of Africa. This is the Tiger Wolf of the Cape.

(2) These are more strongly armed than any of the Sarcophaga: their nails never losing their point or their edge, make them very formidable animals, especially the large species. This genus is divided into very numerous species, varying very much in size and colour, although all similar in form. We can only subdivide them according to some very unimportant characters in their shape and skin. Amongst them are Felis Leo, F. Tigris, F. Pardus, F. Lynx, the common Cat (F. Catus), etc. etc. The distinction between the Leopard and Panther, according to Zoologists, was that the latter had six or seven rows of black spots, in the form of roses, that is, formed by an assemblage of five or six small simple spots on each flank; whilst the former had ten rows of still smaller spots; but some skins brought from Ashantee shewed that the distinction was fallacious. The predominant character of the head of the Lion is, that the line of the face, and that of the skull (which are separated by the rising immediately above the orbit), are almost horizontally continuate. See pl. 15, fig. 2; the Lioness has the line of the skull shorter in proportion to that of the face, and both lines short in proportion to the depth of the skull. In the Tiger these outlines are more serpentine; the developement of the occipital crest is also a distinctive character, see pl. 15, fig. 3; the female has all the parts of the skull shorter. In the Panther the upper outline of the face and skull is uniformly and moderately convex, see pl. 15. fig. 6.

GROUPE III. AMPHIBIA.

GENERA.

1. Phoca. (1) Seal.

4 or 6 incisives above, 4 below; pointed canines; and 20 or 24 grinders, all sharp, or conical without tubercles.	5 toes to each foot, diminishing from the great toe to the small one on the fore feet; but the great and small toe the longest on the hind feet, and the intermediate the shortest. The fore feet enveloped in the skin of the body as far as the carpus, the hind feet enveloped almost to the heel.	Short tail. Head resembling that of a dog.

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2: Trichechus. (2) Morse. Walrus.	
Lower jaw (without incisives and canines) of a compressed form in front, in order to shut between two enormous canines or tusks, in the upper jaw, and pointing downwards. Grinders like short cylinders, cut obliquely; 4 on each side, above and below; 2 of the upper falling at a certain age. 2 incisives like grinders between the canines, and between these (in young individuals) 2 small and pointed incisives.	Nostrils directed upwards, and not terminating the muzzle.

(1) They have the intelligence and mild expressive look of a Dog; they are easily tamed, and soon become attached to those who feed them. Their tongue is smooth and sloped at the end, their stomach simple, their cæcum short, their canal long and tolerably equal. These animals live on fish; they always eat in the water, and can close their nostrils when they dive, by a species of valve. As they dive for a considerable time, it was thought that their foramen ovale remained open, but it is not the case; they have, however, a large veiny cell in their liver, which assists them in diving, by rendering their respiration less necessary to the circulation of the blood. Their blood is very abundant, and very black. The foramen ovale is the aperture or communication by which the blood passes from the right ventricle to the left in the fœtus, in which of course the lungs cannot receive or act on the blood, and circulation must be otherwise ordered. I need not add that this opening closes after the birth of the fœtus. As regards the large veiny cell in their liver, M. Cuvier observes, in his Comparative Anatomy (which is merely the Prodromus of the great work he is preparing), that the considerable magnitude of the liver in those animals which respire least, and its total absence in Insects, which possess the most complete kind of respiration, since their whole body forms as it were their lungs, have induced the conclusion, that the liver in a certain degree supplies the place of lungs, and, like them, serves to remove the two combustible principles from the blood.

(2) The enormous sockets necessary for their canines curl up all the fore part of their upper jaw in the form of a large swelled muffle;

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these tusks receive a pivot from the basis of their alveoli or sockets. Most authors have not recognised their incisives as such on account of their form. The stomach and intestines of the Trichechus are nearly the same as those of the Phoca: they appear to feed on sea weed as well as animal substances. We have as yet distinguished but one species, called Sea Cow, Sea Horse, etc. (Trichechus Rosmarus, *L.*) It inhabits every part of the Frozen Ocean. It surpasses the largest bulls in size, attains twenty feet in length, and is covered with a yellowish close fur. It is sought for its oil and tusks, the ivory of which, although grained, is employed in the arts, and is said never to change its colour. Its skin also makes excellent coach braces. Before M. Cuvier, the Manatus and Dugong were classed with the Trichechus; they are much nearer the Cetacea. The ivory of the Morse is granular, and, when cut, only presents small close round spots; that of the Elephant and Mammoth is reticulated in a lozenge, and therefore cannot be confounded with the former.

GENUS I. PHOCA.

SUB-GENERA.

Phoca proper (or without exterior ears).		
Incisives pointed, the upper exterior longer than the others; grinders edged, and with several points.	All the fingers have a certain degree of movement, and are terminated by pointed nails placed on the edge of the membrane which unites them.	
2. Otaries (or with exterior ears).		
The 4 middle incisives have a double edge, (a form found in no other animal); the exterior are simple and smaller; the 4 inferior are forked; all the grinders simply conical. Pl. 9, fig. 11, 12.	The fingers of the fins almost immoveable. Nails flat and thin.	Membrane of the hind feet prolonged into a strip beyond each finger.

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FAMILY IV. DIDELPHIS.

GROUPES.

1. Pedimana. (1)

Long canines, small incisives in each jaw; the posterior grinders armed with points.

Great toe of the hind foot opposable; without a nail.

2.

2 long, wide, and projecting lower incisives, sharp edged, and answering to 6 in the upper jaw. Upper canines long and pointed; lower canines wanting, or so small as frequently to be hidden by the gum; some have not any.

Great toe large, so much separated from the other toes that it appears directed backwards; no nails; the two toes next the great one united by skin as far as the last joint.

3.

Incisives and upper canines, but no lower canines.

2 toes of the hind feet united like those of Groupe 2, but no great toes.

4. Macropus. (2)

No canines.

5.

2 long incisives, without canines, in the lower jaw; 2 long incisives in the middle of the upper jaw, some small ones on the sides, and 2 small canines.

6.

Only approaching the Carnivora by the articulation of their lower jaw. 2 long incisives in each jaw. Each grinder with two transversal ridges.

Large flat head; short legs; 5 nails on the fore feet, 4 with a small tubercle in place of a thumb on the hind feet, all very long.

Body as if crushed. No tail.

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(1) They generally have all the characters of the teeth of the carnivorous Insectivora, and also approach them very nearly in diet.

(2) See Note 2, page 9.

GROUPE I.

GENERA.

1. Didelphis proper. Sarigues. (1) Opossum.		
10 incisives above, the middle a little the longest; 8 below: 3 anterior grinders compressed, the 4 posterior prickled, the upper triangular, the lower oblong; 50 teeth in all.	Tongue prickly; the great toe behind long, and much separated from the others.	Tail prehensile, and partly naked. Mouth much cleft. Large naked ears.
Subdivided into § 1, Mammæ within a deep pouch. (2) § 2, Only a vestige of a pouch, or folds of skin. (3)		
2. Dasyurus. (4)		
2 incisives and 4 grinders less than the Didelphis.	Great toe behind much shorter, and like a tubercle.	Tail entirely covered with hairs, not prehensile.
3. Perameles. (5) Thylacis.		
10 upper incisives, the exterior parts pointed and wide apart; only 6 lower incisives; grinders the same as in the Didelphis.	Great toes behind short, the two next toes united by the skin as far as the nails; the great toe and little toe of the fore feet like simple tubercles. Large nails, almost straight.	Tail hairy, not prehensile.

(1) These are fœtid and nocturnal animals, with a slow walk; they hide themselves in trees, pursue birds, insects, etc., and do not reject fruits. Their stomach is simple and small, their cæcum moderate and simple. *Penis bisulcus.*

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(2) The young of the Opossum (Did. Virginiana), sometimes sixteen in number, only weigh a grain when born. Although blind, and almost without form, they find the mammæ by instinct, and adhere to them until they have attained the size of a mouse, which is only on the fiftieth day, when they open their eyes. They continue to return to the pocket until they are the size of a rat. The gestation in the uterus is only twenty-six days.

(3) They carry their young on their backs, their tails twisted round that of the mother. There is one species (Chironectes *Illig.* Didelp. palmata, *Geoff.* La petite Loutre de la Guianne, *Buff.*) which has palmated feet and must be aquatic; we do not know if it has a pocket.

(4) They come from New Holland, where they live on insects and dead bodies. Their mouth is less cleft, their muzzle less pointed, and their ears hairy, and shorter than in the Sarigues. They do not climb trees.

(5) They are found in Australasia; their nails show that they dig up the earth, and their hind feet, rather long, that they can run fast.

GROUPE II.

GENUS.

1. Phalangista.

4 back grinders on each side, each presenting 4 points in 2 rows; a large conical compressed tooth in front, and between this and the upper canine 2 smaller pointed teeth.

Tail always prehensile.

SUB-GENERA.

1. Phalangista proper. Balantia. (1)

Skin of the flanks not extended.

Subdivided into
- § 1, The greater part of the tail scaly.
- § 2, The tail hairy to the tip.

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2. Petaurus.

The skin of the flanks, more or less extended between the legs, supports them in the air for some minutes.

Subdivided into
- § 1, With small lower canine teeth. (2)
- § 2, Without lower canine teeth. (3)

(1) They live in the Moluccas on trees, where they find insects and fruits. When they see a man they suspend themselves by the tail, and by fixing the eyes on them, we are able to make them fall, from weariness. They emit a disagreeable smell, notwithstanding which their flesh is eaten.

(2) Their upper canines and their three first grinders, above as well as below, are very pointed; their back grinders have each four points.

(3) The upper canines are very small. Their four back grinders present four points, but a little curved, so as to approach the form of those of the Ruminantia; before these they have two above, and one below, less complicated. This structure renders them still more frugivorous than all the preceding.

GROUPE III.

GENUS.

1. Hypsyprymnus. Kanguroo Rat. (1)

A pointed canine above. The 2 middle upper incisives longer than the others, and pointed: only 2 below, 1 projecting; a long grinder in front, sharp, and dentated, followed by 4 others, armed with 4 blunt tubercles.

Hind legs very disproportionately long; no great toes; the 2 first toes united as far as the nails.

Tail long and strong.

(4) They have the form and habits of the Kanguroo, from which they only differ by their canine in the upper jaw. Their diet is frugivorous, and their stomach large, divided into two pockets, and with several swellings, but their cæcum is moderate and round. *Penis haud bisulcus.* We know but one species. (Macropus Minor, *Shaw.*) It comes from New Holland, where the inhabitants call it Potoroo.

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GROUPE IV.

GENUS.

1. Macropus. Kanguroo. (1) Halmaturus.		
Upper canines wanting, and middle incisives not surpassing the others; 5 grinders on each side, only presenting transversal ridges; the anterior fall with age.	Walk with difficulty on 4 feet, but leap vigorously on their hind feet, which have a large nail in the middle, like a hoof.	The other characters the same as those of the Hypsyprymnus.

(1) By supporting themselves on one leg and their enormous tail, they are able to give hard kicks with the other. They are very gentle animals, however, and feed on grass. Their cæcum is large and swelled out; their radius allows a complete rotation to their fore-arm. Penis haud bisulcus. The Giant Kanguroo (Macropus Major, *Shaw*. Didelphis Gigantea, *Gm.*) is sometimes six feet high; it is the largest animal of New Holland, and was discovered by Cook, in 1779: it now breeds in Europe, and its flesh is said to resemble venison. The young, only an inch high when born, continue to retire into the pouch of their mother even when of an age to graze, putting their muzzles out for this purpose whilst she is in the act of doing so. These animals live in flocks conducted by the old males, and make enormous leaps. It seems that we have hitherto confounded several species of New Holland and the neighbouring countries under this name, the hair of which, more or less grey, only varies by slight shades. The 'Elegant Kanguroo' (Mac. elegans) has been lately discovered. The Kanguroo of Aroé (Didelphis Brunii, *Gm.* and called Pelandor Aroé or Lapin d'Aroé by the Malays of Amboyna) has been known much longer.

GROUPE V.

GENUS.

1. Koala. (1)		
Body short and thick.	Short legs; 5 toes before, divided into 2 groupes, the great and first toe on one side, the three others opposite. The great toe entirely wanting in the hind foot; the 2 first toes united, as in the preceding groupe.	No tail.

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(1) We know but one species; it passes one part of its life on trees and the other in holes which it digs itself. The mother carries her young on her back a long time.

GROUPE VI.

GENUS.

1. Phascolomys. Wombat. (1)

The description already given of the Groupe, is that of the only Genus.

(1) These are true Rodentia by their teeth and intestines, and only preserve their affinity to the Sarcophaga by the articulation of their lower jaw. In a rigorous system it would be necessary to range them with the Rodentia; indeed we should have placed them there, if we had not been conducted by an uninterrupted series from the Didelphis to the Phalangista, from these to the Kanguroos, and from the Kanguroos to the Phascolomys; and if their organs of generation were not perfectly similar to all those in the family of Marsupialia, or animals with a pouch. They live on grass, and have a stomach in the form of a pear, with a thick and short cæcum, furnished, like that of Man and the Orang Outang, with a vermiform appendage. Penis bisulcus. pl. 2, fig. 9; pl. 14, fig. 3. M. Bass has described an animal, exteriorly the same as the Phascolomys, and to which he has also given the name of Wombat, but it has 6 incisives, 2 canines and 16 grinders in each jaw: if there has not been some erroneous combination of two different descriptions, this is another subgenus, to be placed near the Perameles. M. Illiger has already established it under the name of Amblotis, from *αμβλωσις*, abortus. M. Frederic Cuvier remarks, on publishing a drawing of this animal from the life, from which the figure referred to is copied, that, as yet, the Wombat is an isolated species in nature, which forms the type of a Genus, and that its affinities with other Mammalia are so remote, that it is doubtful to which order it ought to be referred. It belongs to Didelphis by its organs of generation; its young are prematurely born, and are developed in a pocket attached to the mammæ. It also approaches the Rodentia by the number and form of its teeth, but not in the uses of them, for they are much better calculated for grinding than gnawing or filing; the articulation of the lower jaw is also different, as is the general form of its body, and the proportions of its limbs, which, with the paces, are somewhat like those of the Bear. Finding it impossible to characterise the Wombat exactly, systematic authors have placed it between the two Orders, of which it is the common link, either as a Didelphis or as one of the Rodentia. Peron tells us, in a voyage to the Australasia, that the flesh of the Wombat is tender and delicate, and that it is found as familiar as a dog in the English fishing huts.

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ORDER IV.

Rodentia.

We have just observed such small canine teeth in the Phalangista, that we may almost consider them to have none; the nourishment of the animals belonging to this Genus is, therefore, chiefly derived from the vegetable kingdom. Their intestines are long and their cæcum simple; the Kanguroos, which have no canines, live entirely on herbs.

We may commence the series of Rodentia by the Phascoloma, whose mastication is still more imperfect. Their two large incisives in each jaw, separated from the grinders by a void space, can scarcely seize living prey, or tear the flesh; they cannot even cut their food, but they serve as files to reduce it by continued labour into detached particles; it is thus that they successfully attack the hardest substances, and often nourish themselves with wood and bark. The better to effect this, their incisives are enamelled only in front, so that their inner edge being worn more than the outer they become sloped: their form is prismatic, and they grow from the root in proportion as the edge is worn away; and this disposition to grow is so strong, that if a tooth is lost or broken, the opposite one, no longer opposed, is developed to a monstrous degree. The lower jaw is articulated longitudinally, pl. 3, fig. 3, so that it has no movement except backwards and forwards, which accords with the action of gnawing: the grinders have consequently flat tops or crowns, in which the ridges of enamel are always transversal, to oppose the horizontal movement of the jaw, and the better to aid trituration. The Genera in which these ridges are simple lines and the crowns very small, are more exclusively frugivorous; those whose teeth have ridges divided into blunt tubercles, are omnivorous; lastly, the small number of those which have points to their grinders, are more inclined to attack animals, and somewhat approach the Sarcophaga.

Their hind quarters generally surpass the front, so that they leap rather than walk. This formation, in some Subgenera, is even as strongly marked as that of the Kanguroos. The intestines of the Rodentia are very long; their stomach simple, or but little divided, and their cæcum very voluminous, even more so than their stomach; nevertheless, the Subgenus Myoxus wants this intestine.

In the whole of this Order, the brain is almost smooth, and without circumvolutions; the orbits are not separated from the hollows of the temple, which are not deep; the eyes are directed sideways; the zygomatic arch, slender and curved downwards,

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bespeaks the weakness of their jaws; their fore-arms scarcely turn, and the two bones are often united; in short, the inferiority of these animals is evident in most of the details of their organization. The greatest number of Genera, however, (which have strong clavicles,) enjoy a certain degree of dexterity, and make use of their fore-feet to convey their food to their mouth.

ORDER IV. RODENTIA.

GROUPES.

1.

Strong clavicles.

2.

Rudimentary clavicles.

GROUPE I.

GENERA.

1. Castor. Beaver. (1)

4 grinders with flat surfaces, as if composed of ossified ribands, folded so as to present 3 notches, 1 notch on the inside and 2 on the outside in the upper grinders, and the reverse in the lower. Incisives very strong. Pl. 5, fig. 21, 22.	5 toes to each foot, those behind united by membranes; a double oblique nail to the toe following the great toe.	Tail flat, horizontal, and covered with scales. Two glandulous pouches affording the castoreum.

2. Mus. (2)

Inferior incisives pointed.	No striking exterior characters.	

3. Spalax. Talpoides. Mole Rats. (3)

Incisives too large for the lips to cover, extremities of the lower wedge-shaped. 3 grinders with blunt tubercles, the anterior the largest.	5 short toes to each foot, with flat slender nails.	Tail and exterior ears short, or none. Eyes excessively small.

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4. Bathyergus. Cape Mole Rats. (4)		
4 grinders, the posterior deeply sloped on the exterior side. Pl. 5, fig. 2.	Feet as Spalax.	Short tail or none. Eye small, but visible.
5. Helamys. Pedetes. (5)		
4 grinders, each composed of 2 plates. Incisives truncated.	5 toes to the fore feet, armed with very long and pointed nails; 4 toes to the hind feet, all separate, even in the metatarsus, and terminated by large nails resembling hoofs.	The figure of the Jerboa, but the disproportion of their hind legs not so great, and their incisives not pointed.
6. Arctomys. Marmot. (6)		
5 grinders on each side above, 4 below, all with points; lower incisors pointed.	Short legs, head long and flat.	Tail covered, moderate or short.
7. Sciurus. Squirrel. (7)		
Lower incisives much compressed. 4 tuberculous grinders, with 1 very small before them on the upper jaw, and falling in early age.	4 toes before, 5 behind.	Long tail, with long hairs hanging from its sides like the beards of feathers.
8. Cheiromys. Aye Aye. (8) Madagascar Squirrel.		
2 incisives in each jaw, the lower exceedingly compressed. Pl. 5, fig. 14, 15.	5 toes on each foot; 4 of those on the fore foot excessively long, the middle much thinner than the others. Pl. 14, fig. 2. Pl. 1, fig. 18.	Great toes separate from the other toes on the hind feet. Tail long and hairy.

(1) Beavers are rather large animals of an aquatic life; their feet and tail aid them equally in swimming. As they live principally on

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the bark of trees and other hard substances, their incisives are very strong, shoot up again from the roots in proportion as they are used at the top, and thus serve them for cutting all kinds of trees. They have large glandulous pockets, which terminate at their prepuce, and produce a strong smelling pomatum, much employed in medicine under the name of castoreum. In both sexes the organs of generation are at the extremity of the rectum, so that there is but one exterior opening. The Beavers select those waters which are too deep to be frozen to the bottom, and, as often as possible, running waters; because, by cutting the wood above the current, it carries it down to the place they wish. They preserve the water of an equal height by a dam made of all kinds of branches mixed with stones and mud, which they strengthen every year, and which at length vegetates and becomes a hedge. Each hut has two floors, and serves for two or three families; the upper, which is dry, for the animals to dwell in; the lower, under water, for stores of bark: the door opens under water, without any communication with the land. These huts are made of branches of trees interwoven, and plastered with mud. They have also several holes along the bank, where they take refuge when their huts are attacked: they only dwell in these huts during the winter; in the summer they disperse and live singly. The beaver is easily tamed and habituated to feed on animal substances. The beaver of Canada is of an uniform reddish brown, its fur is much sought after for felting; there are some of a light colour, some black, and some white. We are not able to say, notwithstanding the most scrupulous comparisons, if the Castors or Beavers which live in holes along the Rhone, the Danube, the Weser and other rivers, are of a different species to those of America, or if their vicinity to Man prevents them from building.

(2) Linnæus and Pallas seem to have assembled in one single groupe, under the name of Rats, all the Rodentia with clavicles which have not any very sensible external character; the only common character we can attach to them, is that of the lower incisives being pointed, which was indicated by Linnæus.

(3) They live under ground, hollowing out and throwing up the earth like Moles, though with a much less powerful apparatus; they feed only on roots. The Zemni, Slepez or Blind Mole-rat (Mus. Syphlus, *Lin.*), has no eye visible exteriorly; but when we remove the skin, we find a very small black point, which appears to be organised like an eye, without the power of serving as such, since the skin passes over it, without opening, becoming thinner, or even presenting less hair on that part. This fact may have given the Ancients the idea of the Mole being perfectly blind.

(4) The only two species known (Mus Maritimus, M. Capensis) are common in the neighbourhood of the Cape of Good Hope, and hollow out the earth to such a degree, that it is dangerous to ride on horseback near their burrows. M. Illiger separates the Mus Capensis from the Bathyergus or Mus Maritimus, to put it with the Mus Hudsonius and Aspalax, or his Georychi. The formation of the Mus Capensis is absolutely the same, however, as that of the Mus Maritimus.

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(5) We know but one species, from the Cape of Good Hope, as large as a rabbit, of a light tawny colour with a tufted tail, black at the end. (Mus Cafer, *Pall.* Dipus Cafer, *Gm.*)

(6) They pass the winter in a state of torpor, in deep holes, the entrance of which is closed by a heap of hay. They live in numbers, and are easily tamed. We know three species in the Old World. Mus Alpinus, *Lin.*, which lives on the high mountains, immediately below the perpetual snows; Mus Bobac, *Lin.*, which digs into the hardest soils; and Mus Citillus, *Lin.*, which has an extraordinary fondness for flesh, and does not even spare its own species. There are others in America.

(7) The thumb of the fore foot is sometimes supplied by a tubercle. They are swift animals, living in trees, and nourishing themselves with fruits; their heads are large, and their eyes projecting and lively.

(8) The lower incisives much more compressed and much more extended than those of the squirrels, resemble ploughshares. Their great toe being opposable to the others, makes them, amongst the Rodentia, what the Sarigues are amongst the Sarcophaga. We know but one species, discovered in Madagascar by Sonnerat (Sciurus Madagascariensis), as large as a hare, brown mixed with yellow, a long and thick tail with large, black, and stiff hairs, and large naked ears. It is a nocturnal animal, moves with difficulty, and lives in a hole in the ground. It uses its long slender toe to convey its food to the mouth. M. Cuvier, making the teeth the primary character, places this extraordinary animal with the Rodentia; Illiger with the Pollicata or Quadrumana, apparently, not merely on account of the opposable thumb, but from the important additional character that the orbit is separated from the hollow of the temple by a bony partition, pl. 1, fig. 18 (which is found in the Quadrumana alone), so that the skull resembles a monkey's. This animal, approaching the Genus Myoxus and Sciurus by its tail, has been included in them by some Zoologists, but M. Kuhl considers it to connect the Pollicata with the Prensiculantia, or the 2nd with the 4th order of Illiger.

GENUS II. MUS.

TRIBES.

1. Auriola.

Grinders prismatic, or with a flat top, traversed throughout their length with plates of enamel. They are formed of 5, 6, or 8 triangular prisms, placed alternately on 2 lines. Pl. 5, fig. 3.

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Sub-genera.

1. ONDATRA. (1) Feet palmated. — Tail long, compressed, and scaly.

2. HYPUDÆUS. (2) — Tail hairy, and nearly the length of the body.

3. GEORYCHUS. LEMMING. (3) Fore toe formed for digging. — Tail and ears very short.

2.

Grinders divided into roots from their bases, (as those of the Hedge-Hog, Pl. 4, fig. 14) but with flat crowns, presenting transversal projecting lines, and hollows. Pl. 5, fig. 4.

Sub-genera.

1. ECHIMYS. SPINY RAT. (4) 4 grinders, the lower of 4 transversal plates united two and two; the upper of 3 plates, 2 only of which are united; spiny hairs.

2. MYOXUS. LOIR. (5) DORMOUSE. 4 grinders divided by transversal bands; hair soft; tail covered and tufted.

3.

Grinders more or less tuberculous, not presenting the transversal furrows distinctly.

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Sub-genera.	1. Hydromys. (6) The crown or top of their grinders, obliquely quadrangular, hollow in the middle like a spoon.	Hind feet palmated two thirds.
	2. Mus proper. Rats. (7) 3 grinders with blunt tubercles, the anterior the largest.	Tail long and scaly.
	3. Hamsters. Cricetus. (8) Cheek pouches like Monkeys.	Tail short and hairy.
	4. Jerboa. Dipus. (9) Hind extremities disproportionately long.	Long tail, tufted.

(1) The Ondatra or Musk Rat of Canada (Castor Zibeticus, *Lin.* Mus Zibeticus, *Gm.*) is as large as a rabbit, and of a reddish grey. In winter they build mud huts on the ice, several of them living together; they penetrate by a hole to the roots of the Acorus, on which they feed. When the frost closes their holes they eat one another. The habit of building has caused several authors to approach the Ondatra to the Genus Castor.

(2) Of this tribe the Mus Œconomus, *Pall.* lives in a little chamber, in the form of an oven, hollowed out under the turf, and whence several narrow channels are branched off in different directions: other channels communicate with a second cavity, where they heap up their provisions. They are found throughout Siberia.

(3) The species of the north (Mus Lemmus, *Lin.*) is the size of a rat, its skin varied with yellow and black; it is very celebrated for the migrations it makes from time to time, without any fixed period, in innumerable troops. They are said to march in a straight line, without rivers, mountains, or any other obstacle stopping their progress; and to destroy every thing in their passage. Their usual habitation appears to be on the borders of the Frozen Ocean.

(4) These animals are from America, and with a form nearly the same as our rats, generally have the ears flattened, broad, stiff, terminating in a point or prickly, and as flat as the blade of a sword.

(5) They live in trees, nourish themselves with fruits, and in our climates pass the winter in a lethargic slumber. It is the only subgenus in the numerous order of Rodentia without a cæcum. The Loir (Mus Glis), from the forests in the south of Europe, is considered by M. Cuvier to be the rat which the Ancients fattened as a great delicacy.

(6) M. Cuvier thinks that the Quouiya of Azzara (Mus Copyus, *Molin* et *Gm.*), the skins of which are brought by thousands to Europe, from North America, for the use of hatters, should be classed with the

Hydromys: its characters have not been examined by Anatomists; it lives in holes under ground, approaches the Cabiai in size, and resembles it in colour; but it is distinguished by its fine hair, by the down beneath it, by its long tail, the number of its toes, etc.

(7) There are three species which have become very common in houses: the Mouse (Mus Musculus, *Lin.*) known in all times, and in all parts of the world: the Common Rat (Mus Rattus, *Lin.*), of which the Ancients have not spoken, and which appears to have penetrated into Europe in the middle age; it is more than double the size of the mouse in all its dimensions: the Surmulot (Mus Decumanus, *Pall.*), which did not arrive in Europe until the 18th century, and which is now the most common rat in Paris and other great cities; one fourth larger than the rat, it only differs from it by its reddish brown hair, and by its tail, longer in proportion. These two large species appear to be originally from the East; our vessels have carried them every where, as well as the mouse. The mouse of Cairo (Mus Cahirinus, *Geoff.* Description de l'Egg. Mammif.) has prickles instead of hairs on the back. Aristotle had already remarked it.

(8) This animal, so agreeably varied in colour, is one of the most destructive in existence, from the quantity of grain which it amasses, and with which it fills its hole, although sometimes seven feet deep. It is common in all the sandy countries which extend from the North of Germany to Siberia. One of the most extraordinary species, if it be authentic, is the Mus Bursarius of Shaw, originally from Canada, ash colour, the pouches of which are said, when full, to project from each side of the mouth, and to surpass the head in size.

(9) They have a wide head and large projecting eyes. They were called two-footed rats by the Ancients, and in fact they scarcely ever move, except by great springs on their hind feet. Their fore feet have five toes; in the hind feet, the metatarsus, ~~with~~ three ~~toes in the~~ middle, is only formed of a single bone, like what we call the tarsus in birds. In certain species there are small lateral toes. They live in subterranean holes, and pass the winter in a profound lethargy.

GENUS I. SCIURUS.

SUB-GENERA.

1.	(1) With and without tufts of hair to the ears.	
2. Tamias.	Cheek pouches.	Subterraneous.
3. Guerlinguets.	With an enormous pendent scrotum.	Very long tail, almost round.

4. Pteromys. Polatouches. (2) Flying Squirrels. Skin of the flanks extended between their fore and hind legs, so as to sustain them some instants in the air.		

(1) The American species, and the greater number of those of the ancient Continent, have no tufts on their ears. There are some Squirrels in warm countries remarkable for the longitudinal band with which their skin is varied

(2) There is a species in Poland, Russia, and Siberia (Sciurus Volans) which leads a solitary life in the forests. The Sc. Voluccella lives in troops in the temperate meadows of North America. The Sc. Petaurista, almost as large as a cat, is found in the Indian Archipelago, as well as a smaller species called Sc. Sagitta.

DIVISION II.

GENERA.

With rudimentary clavicles.

1. Hystrix. Porcupine. (1) 4 grinders, cylindrical, with 4 or 6 deep impressions on the upper surface. Pl. 5, fig. 6.	Stiff and sharp prickles like the Hedge-hog's. Tongue armed with spiny scales.	4 toes before, 5 behind, all with large nails.
2. Lepus. Hares. (2) Upper incisives double, *i. e.* with a smaller tooth behind. Pl. 5, fig. 8. 5 grinders on each side, composed of two soldered vertical plates. Pl. 5, fig. 7; a sixth in the upper jaw, but very small.	Inside of their mouth and soles of their feet hairy.	5 toes before, 4 behind.
Sub-genera. 1. Lepus proper. (3) Long ears.	Hind feet the longest.	Short tail.
2. Lagomys. Pica. (4) Ears moderate.	Feet almost equal.	No tail.

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3. Cabiai. Hydrochœrus. Water Hog. (5)	
4 grinders, the posterior longer and composed of numerous parallel plates, the upper anterior forked on the outer edge, the lower anterior on the inner. Pl. 5, fig. 9.	4 toes before, 3 behind, with large nails, and united by membranes.
4. Cavia. Guinea Pig. Cobay. (6)	
Grinders of 1 simple plate, and 1 forked inside in the lower, and outside in the upper jaw. Pl. 5, fig. 18.	Toes separate.
5. Chloromys. Agouti. Dasyprocta. (7)	
4 grinders, with flat crowns, irregularly furrowed, the upper sloped on the inner edge, the lower on the outer. Pl. 5, fig. 17.	
6. Pacas. Cœlogenus. (8)	
Hollow cavity in the cheek, from the great size of the zygomatic arch. Pl. 1, fig. 19, a.	5 toes before and behind; the 5th very small.

(1) They live in holes, and have many of the habits of rabbits. Their grunting voice, added to their thick and truncated muzzle, has caused them to be compared to the Hog.

(2) They have an enormous cæcum, five or six times larger than the stomach, and furnished within by a spiral plate throughout its length.

(3) The space under their orbit is pierced like net-work in the skeleton.

(4) The space under their orbit is simple, and their clavicles more perfect. They often utter a strong sharp cry. They are as yet only found in Siberia, and were made known by Pallas. Linnæus and Pallas united the four remaining genera under the name of Cavia, but it is impossible to find any other common and positive character than that of their imperfect clavicles, although the species which compose them

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are not wanting in analogies in habits and manners: they are all from the new continent.

(5) We know but one species, Cavia Capibara of Lin., Cabiai of Buff. It lives in troops in the rivers of Guiana and Amazonia: it is good game, and the largest of the Rodentia. The Castor alone approaches it in size.

(6) They represent the Cabiai in miniature. We know but one species, now very much multiplied in Europe, where it is domesticated, because its smell is said to drive away rats. There is reason to think that it is from an animal of America called Aperea, of the same size and form, but with the skin entirely of a reddish grey. It is found in the woods of Brazil and Paraguay.

(7) They resemble our hares and rabbits in their nature and flesh, and seem to take their place in the Carribee Islands and warm parts of America.

(8) Their flesh is said to be very good. There is a species or variety, tawny colored and brown, spotted with black. Cavia Paca, *Lin.*

ORDER V.

Edentata

Or Quadrupeds without incisives, form the last order of animals with nails. Although united only by a negative character, they present some positive affinities, such as the large nails which embrace the extremity of the toes, and approach more or less to the nature of hoofs, pl. 4, fig. 11, 12, an indolence or slowness of movement, and a want of agility evidently occasioned by the disposition of their members: but these affinities still leave sufficient intervals to allow of the order being divided into three Groupes.

ORDER V. EDENTATA.

GROUPES.

1. Tardigrada. (1)

Short face, with grinders and canines.	Excessive slowness of movement.	Form and structure strange and irregular.

2. Edentata proper.

Pointed muzzle, with and without grinders.

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3. Monotrema. (2)

No teeth, or teeth without roots.	The same supernumerary bones on the pubis as the Kanguroos.	Five toes on each foot, and the males a spur on those behind, like some of the Gallinaceæ.

(1) They owe their name to their excessive slowness, the result of a very irregular construction, wherein nature seems to have amused herself by producing something imperfect and grotesque.

(2) The third groupe of Edentata are the animals comprehended by M. Geoffroy, under the name of Monotrema, because they have but one exterior opening for the semen, urine, and excrement. Their organs of generation present some extraordinary anomalies: although they have no pocket under the belly, they have the same supernumerary bones on their pubis as the family of Didelphis in the Sarcophaga. Canales delatorii in uretram deferuntur, quæ prope cloacam ad basim penis pandit, at hic haud perforatur nec sulcatur quidem spermatis ducendi causa. As it has been hitherto impossible to discover their mammæ, we know not if these animals are viviparous or oviparous. They are not less extraordinary in their skeleton, especially in the species of clavicle common to the two shoulders, placed before the ordinary clavicle, and analogous to the furcula of birds. Lastly, besides the five nails to each foot, the males have a spur attached to the astragal of the hind foot, which may be compared to that of the Gallinaceæ. These animals have no external conch to their ears, and their eyes are very small. They are only found in New Holland.

GROUPE I. TARDIGRADA.

GENERA.

1. Bradypus. Sloth. (1)

Grinders cylindrical, and sharp canines longer than the grinders. Pl. 1, fig. 20.	Toes united by the skin, with large nails; lower parts of their toes ossify at a certain age.	Arms and fore arms much longer than their thighs and legs, so that they walk on their elbows; thighs so obliquely fixed that the animal cannot approach the knees.

(3) The Sloths have cylindrical grinders, and sharp canines longer than the grinders, two mammæ on the breast, and the toes united to each other by the skin, and only evident exteriorly by enormous nails, compressed and crooked, always bent towards the inner part of the

sole of the foot. Their hind feet are articulated obliquely on the leg, and only rest on their outer edge; the joints of their toes are articulated by contracted ginglymi (a species of joint which admits but of one kind of flexion), and the first are soldered at a certain age to the bones of the metacarpus or metatarsus, all of which become ossified ultimately from want of use. Perhaps the most extraordinary anatomical peculiarity in the Aï, and which seems expressly designed to deprive it of the use of the foot, is, that the upper surface of the astragal presents a conical hollow, in which the pointed extremity of the fibula enters like a pivot, thus affording only a rotatory motion: in all other animals it is the tibia which is articulated with the astragal, and transversely, as in p. 3, f. 2, so that the foot may be bent at will upon the leg. To this inconvenience in the organisation of the extremities is joined one not less great in their proportions. Their arms and fore-arms are much longer than their thighs and legs, so that when they walk, they are obliged to drag themselves along on their elbows: their basin is so large, and their thighs directed so much sideways, that they cannot approach their knees: their gait is the natural effect of so disproportionate a structure. In the Bradypus there is a posterior or second union between the os sacrum or tuberosity of the os ischium; other quadrupeds have but the anterior union, all the rest being free, and the interval between the posterior part of the sacrum and the ossa innominata (called the ischiatic notch) void, to lodge the muscles and other soft parts: the Bradypus has a hole instead of the ischiatic notch, pl. 14, fig. 8. The Phascolomys (Didelphis Ursina, *Shaw*) is the only quadruped besides presenting this formation, and it is sufficient to see it walk or rather creep, to be convinced that it is scarcely more active than the Sloth. Mr. Carlisle has observed that the arteries of the members commence by dividing into an infinity of ramifications, which afterwards unite in a trunk, giving out the ordinary branches. As this structure is also met with in the Loris, whose gait is scarcely less slothful, it probably causes the slowness of their motions; for as these ramifications are not found in animals of quick or ordinary powers of movement, it may be concluded that they influence those of the Bradypus by retarding the circulation, which must be considerably less rapid than by the ordinary single branch. In addition to this, the Loris, the Ourang Outang, the Coaita, all very slow animals, are remarkable for the length of their arms. The Bradypi live on trees, and never quit one until they have stripped it of its leaves, so painful is it to them to reach another; we are even assured that they allow themselves to fall from the branch to avoid the labour of descending. They produce but one young one at a time, which they carry on their back. The viscera of these animals is not less singular than the rest of their formation. Their stomach is divided into four bags, very similar to the four stomachs of the Ruminantia, but without cells or any other projecting parts in the interior, whilst their intestinal canal is short and without a cæcum. The Aï is the only animal amongst the Mammifera yet known, which has nine cervical vertebræ.

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There are three considerable portions in Spain of a fossil animal, called Megatherium; the most complete is that in the cabinet of Madrid, which was sent from Buenos Ayres in 1789: the soil in which it was found, three leagues W. S. W. of that city, is only ten metres (thirty-three feet) above the level of the sea: the second portion was found in Lima, the third in Paraguay; their remains consequently appear to be spread throughout the most distant regions of South America. The Spanish Government would probably present one of the other two neglected portions of the Megatherium to the British Museum, if the request were made. The most striking anatomical character common to the Megatherium and the Bradypus is the long descending apophysis of the zygomatic arch, pl. 13, fig. 1, 2. There is nothing approximating to this apophysis (the purpose of which is unknown) in any other animal, unless we except the Kanguroo. The toes of the Megatherium agree in many respects with those of the Ant Eaters; the last or more slender joint, which bears the nail, is inserted within the preceding, which is like a cylinder; see pl. 13, fig. 1. The bones of the metacarpus are not soldered together in the Megatherium as in the Aï. The Megatherium of Paraguay is about 12 feet long, and 6 feet high; another species, the Megalonix of Jefferson, about a third less, has been found in Virginia. Shaw has described, under the name of Bradypus Ursinus (Prochilus, *Illiger*), an animal brought to England from the East Indies, the shape and size nearly that of a bear, with five toes, armed with nails on each foot, without incisives, and with unequal canines and grinders, which would seem to mark a generic difference from the Sloths. It would be very interesting to have its anatomy. Dr. Buchanan (Travels in the Mysore Country, vol. 2, p. 198) assures us that it is a true Bear, and feeds on white ants, the fruit of the sergho, etc. M. Tiedeman has just sent M. Cuvier a drawing of this animal, which he calls *Ursus Longirostris*, from a living one now in Berlin. See pl. 15, fig. 16.

GROUPE II. EDENTATA PROPER.

GENERA.

With grinders.

1. Tatoo. Dasypus, *Lin.* Armadillo. (1)		
Thick scaly coat divided into compartments, covering the head, body, and, often, the tail. (1) Grinders cylindrical.	Always 5 nails behind.	Tail presenting a succession of rings; or else with tubercles, like the legs.

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2. Orycteropus. (2)		
Grinders distinct from those of all other quadrupeds, being solid cylinders, traversed within by small longitudinal canals, like a sugar cane. Pl. 5, fig. 5.	Nails flat.	
Without grinders.		
3. Myrmecophaga. (3) Ant-Eaters.		
Small mouth without teeth; filiform tongue, which elongates considerably to penetrate the nests of the Termites, fixing them by its viscous saliva.	Fore nails strong and cutting.	
4. Pangolin. Manis. (4)		
No teeth. Tongue extensible.	Body, limbs, and tail, covered with sharp, large, imbricated scales.	Raise their scales, and roll themselves up for defence.

(1) This armour is formed of one buckler in front, a second very large and convex on the shoulders, a third similar to that in front on the croup, and between the two latter several parallel bands which give the body the power of bending itself. These animals have large ears; sometimes four sometimes five large nails before, and always five behind; the muzzle rather pointed: seven or eight cylindrical grinders on each side, separated from each other, and without enamel interiorly; the tongue smooth, not very extensible, and some hairs scattered between their scales or on those parts of the skin which have no coat. They dig holes in the ground, and live partly on vegetables, and partly on insects and dead bodies; their stomach is simple, and they have no cæcum. They are all originally from the warm or temperate parts of America.

(2) These have long been confounded with the Ant-Eaters, because they nourish themselves in the same manner, have the same shaped head, and their tongue is also extensible. Their stomach is simple, but muscular towards the pylorus; their cæcum small and obtuse. We know but one species.

(3) In a state of repose their nails always remain bent inwards, towards a callosity of the wrist, which prevents their touching the ground,

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he animal always leaning on the side of its foot. The stomach of the Ant-Eater is simple, and muscular towards the pylorus, their canal moderate, and without cæcum. They all inhabit the warm and temperate parts of the New World, and bring forth one young one at a time, which they carry on their back. There is no zygomatic arch in the skull of the Ant-Eater. See pl. 2. fig. 1.

(4) Their stomach is slightly divided in the middle, and they have no cæcum. They are only found in the Old World. Pangoeling in the Java language, according to Séba, signifies an animal which rolls itself into a ball. In Bengal it is called Badjarkita, or stony reptile.

GROUPE III. MONOTREMA.

GENERA.

1. Echidna. Tachyglossus. Spiny Ant-Eaters. (1)		
Muzzle elongated; mouth small, with an extensible tongue, like the Ant-Eaters.	No teeth, but the palate furnished with several rows of small spines directed backwards.	Short feet, with 5 long, strong nails. Upper part of their body covered with spines, as the Hedge-hog, and like which they roll themselves into a ball. Tail very short.
2. Ornithorhyncus. Platypus. (2)		
Muzzle elongated, enlarged and flattened, resembling the beak of a duck, like which its edges are armed with transversal plates, Pl. 14, fig. 4.	Teeth only in the back part of the mouth, two on each side, with flat tops and no roots. Pl. 10, fig. 2, 3, *a*, *b*.	A membrane to all the feet, uniting the toes, and, in the fore feet, extending beyond the nails. Tail flattened.

(1) They live on Ants also; their stomach is ample, almost globulous, and their cæcum moderate. Penis quatuor tuberculis terminatus. There are two species, Ornithorhyncus Histrix, *Home* (Myrme. Aculeata, *Shaw*) and Ornithorhyncus Setosus, *Home*.

(2) Their tongue is in some measure double, one part in the beak and prickly, another at the base of the first, thicker, and having two small fleshy points at the tip. Their stomach is oblong, and the pylorus is near the cardia. The cæcum is small, and there are many projecting parallel scales in the intestines. Penis duo tuberculis terminatus. The Ornithorhyncus inhabits the rivers and marshes of New Holland, near Port Jackson. We know but two species, Ornith. Fuscus, and Ornith. Rufus, and perhaps the latter is only a variety from age.

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Pachydermata.

The Edentata terminate the series of animals with nails, and we have seen that there are some amongst them whose nails are so large that they envelope the extremities of their toes, so as in some measure to approach animals with hoofs. However, they still have the faculty of bending these fingers around different objects, and of seizing them with more or less force: the entire absence of this faculty distinguishes animals with hoofs. Using their feet as supporters only, they never have any clavicles; their fore-arms constantly remain in a state of extension, and they are reduced to feed on vegetables. Their forms, and manner of life, offer fewer varieties than those of animals with nails, and we can only establish two Orders amongst them; those which ruminate, and those which do not; but the latter, to which we give the common name of Pachydermata, admit of a subdivision into Families.

ORDER VI. PACHYDERMATA.

FAMILIES.

1. Proboscidea. (1).
   Trunk. Tusks in the incisive bones of the upper jaw.

2. Pachydermata proper. (2)
   4 or 3 toes to their feet.

3. Solipeda.
   Only 1 toe visible, and a single hoof to each foot; but under the skin on each side of the metacarpus and metatarsus are small points representing lateral toes.

(1) The Proboscidea have five toes on each foot, very complete in the skeleton, but so enveloped in the callous skin which encircles their feet, that they are only visible exteriorly, from the nails which are attached to this species of hoof. They have no canines or incisives, pro-

perly so called, but two tusks are set in their incisive bones which pass beyond the mouth, and often grow to an enormous size. The large sockets necessary for these tusks render the upper jaw so high, and shorten the bone of the nose so much, that the nostrils are found in the skeleton towards the top of the face, but in the living animal they are prolonged into a cylindrical trunk, composed of several thousands of little muscles, variously interwoven, moveable in every sense, gifted with exquisite feeling, and terminated by an appendage in the form of a finger. This trunk gives the Elephant almost as much dexterity as the perfection of the hand gives to the Ape. It serves for seizing every thing the animal wishes to carry to its mouth, and to pump up its drink, which it afterwards throws into its throat by curving this admirable organ; thus supplying the place of a long neck, which would not have sustained its large head and weighty tusks. The head is made lighter, however, by the large void cells, between the two plates of the skull. The lower jaw has no incisives. The intestines are very voluminous, the stomach simple, the mammæ only two, and under the breast; the young one sucks with its mouth and not with its trunk. We know but one *existing* genus of Proboscidea, the Elephant.

(2) Those with an even number of toes have the feet in some measure forked, and, in several respects, their skeleton approaches that of the Ruminantia; they even resemble them in the complication of their stomach.

FAMILY I. PROBOSCIDEA.

GENERA.

1. Elephas. Elephant. (1)

Grinders composed of vertical plates of a bony substance enveloped in enamel, and joined together by a third substance, called cortical. Pl. 9, fig. 2, 3.

2. Mastodon. Mammoth (extinct). (2)

Differ from the Elephants in their grinders, which present thick conical points, worn into small surfaces by use. Pl. 9, fig. 6.

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(1) After having studied Elephants a long time, Zoologists do not find that their intelligence approaches that of the Dog or several other Carnivora. Their nature is very gentle, they live in herds under the conduct of the old males, and they eat only vegetables. Their grinders succeed or replace each other, not from beneath, as our second grinders succeed to our first, but from behind; so that in proportion as a tooth is worn away, it is pushed forwards by that which comes after it; thus the Elephant has sometimes one, sometimes two grinders on each side, four or eight in all, according to the period. The first of these teeth have but few plates, and those which succeed them have always more. It is said that some elephants thus change their grinders even eight times: they only change their tusks once. The Elephants of the present age, clothed in a rugged skin, almost without hair, only inhabit the torrid zone of the old world, and only two species have been recognised.

The Indian Elephant (Elephas Indicus) has an oblong head, a concave forehead, pl. 13, fig. 6, and the crowns of its grinders present undulating ribbons, which are parts of the plates which compose them, worn by trituration, pl. 9, fig. 2. This species has smaller ears and has four nails on its hind feet. It is found from the Indies to the Eastern Ocean, and in the large islands south of India. From time immemorial these animals have been trained for drawing and carrying burthens, but we have never been able to propagate them in their domestic state, although the tales of their pretended modesty are void of foundation. The females have only short tusks, and many males resemble them in this respect.

If I recollect right, Colonel Fitz-Clarence remarks, as a character and organization of the Elephant which has hitherto escaped Naturalists, that its mouth contains a reservoir for water, which it spouts with its proboscis between its legs, at pleasure, to cool the under part of its body. The comparative Anatomists and Zoologists here are ignorant of this formation; perhaps the reservoir is in the proboscis itself.

The African Elephant (Elephas Africanus, *Cuv.*) has a round head, a convex forehead, see pl. 13, fig. 5, large ears, and grinders presenting lozenges on their crowns, pl. 9, fig. 3. They seem to have but three nails on their hind feet. This species is found from Senegal to the Cape. We do not know if it is met with on the eastern coast of Africa, or if it is there superseded by the preceding species. The tusks of the females are as large as those of the males, and both are generally bigger than those of the Indian. The Elephant of Africa is not tamed in the present day, but it appears that the Carthagenians made the same use of them as the Indians. Burckhardt furnishes us with a curious proof of the Elephants of Nubia having been formerly used to ride on, in his extracts from the history of Bahnase, p. 527. In almost all parts of the two continents we find the bones of a species of Elephant, under ground, approaching that of India, but its grinders have narrower and straighter ribbons; the sockets for the tusks are much longer in proportion, and the lower jaw more obtuse, pl. 13, fig. 4. An individual recently taken out of the ice on the coast of Siberia by Mr. Adams,

appeared to have been covered with thick hair of two sorts, so that it might possibly have lived in a cold climate. It has long been extinct.

(2) The Mammoth has been entirely destroyed, and has left no living species. It had the feet, the tusks, the trunk, and many other details in structure in common with the Elephant, pl. 3, fig. 9, 10, 11, and for comparison, pl. 13, fig. 4, 5, 6; pl. 10, fig. 4, 5. The similar formation of the teeth in the Mammoth, the Hippopotamus, the Hog, etc., has very unaptly given rise to the belief that the former was carnivorous. Their teeth, which succeed each other from behind, like those of the Elephant, present as many more pair of points as they are more aged. The Great Mammoth, Mastodon Gigantium, equalled the Elephant in size, but in its proportions was still more clumsy. The Mastodon Angustidens has narrower grinders than those of the preceding, and the points are worn into disks like trefoils, which has caused several authors to confound them with those of the Hippopotamus. It was a third less than the Great Mammoth, and its legs much shorter. In some places its teeth, tinged with iron, acquire a tolerably good colour by heating, and are called occidental turquoise.

FAMILY II. PACHYDERMATA PROPER.

GENERA.

With forked feet.

1. Hippopotamus. (1)

4 toes, almost equal, with small hoofs. A canine on each side of each jaw, those of the upper straight, the lower very large and curved inwards. Pl. 2, fig. 3.	6 grinders on each side, the 3 anterior conical, the 3 posterior armed with 2 pair of points, the worn surfaces presenting trefoils. Pl. 9, fig. 7.	4 incisives to each jaw; the upper short, conical, and curved inwards; the lower long, cylindrical, pointed, and projecting outwards.

2. Sus. (2)

2 large middle toes armed with strong hoofs, and 2 exterior toes scarcely touching the ground.		

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Sub-genera.	1. Sus proper. (3) 24 or 28 grinders in each jaw, the posterior with the crown or top tuberculous, the anterior compressed.	6 incisives to each jaw.	Tusks.
	2. Phaco Choerus. (4) Grinders composed of cylinders united by a cortical, and succeeding each other from behind.	Head singularly large, and a fleshy lobe pendent from each cheek.	Tusks rounded, directed upwards from the sides of the jaws. Pl. 2, fig. 4.
	3. Pecaris. Dicotylus. (5) Peccary. Grinders and incisives as Sus Proper, but the canines not passing beyond the mouth.	A glandulous opening on their loins, affording a fœtid humour.	No tail. No small exterior toe on the hind feet.
3. Anoplotherium (extinct). (6) 6 incisives to each jaw; 4 canines resembling and not larger than the incisives, and 28 grinders, without the void interval which is in all other animals except Man. Pl. 11, fig. 3, 4.			
Without forked feet.			
4. Rhinoceros. (7) 3 toes to each foot; a solid fibrous horn or horns, as if of agglutinated hairs, on the nose. Pl. 2, fig. 6.		7 grinders on each side, the upper with square crowns, with projecting lines or ridges; the first 6 of the lower presenting double crescents, and the last a triple crescent. Pl. 9, fig. 4, 5.	Incisives varying.

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5. Daman. Hyrax. (8)		
2 strong incisives in the upper jaw, curved inwards; 2 very small canines when young; 4 incisives, without canines, in the lower jaw.	Grinders as Rhinoceros.	4 toes to their fore feet, 3 to the hind feet; the inner toe of the hind foot with a crooked nail instead of the small round hoof. A tubercle instead of a tail.
6. Palæotherium (extinct). (9)		
A short fleshy trunk. 3 toes to each foot. Pl. 11, fig. 2.	Grinders as Rhinoceros.	6 incisives and 2 canines to each jaw.
7. Tapir. (10)		
Nose in the form of a small fleshy trunk. 4 toes to the fore feet, 3 to the hind. Pl. 11, fig. 1.	27 grinders, presenting 2 transverse and rectilineal ridges before trituration. Pl. 9, fig. 9, 10.	Ditto.

(1) These animals have a very bulky body, no hair, very short legs, the belly almost dragging on the ground, the head enormous, and terminated by a swelled out muzzle which contains the apparatus of their large anterior teeth: their tail is short; their eyes and ears small; and their stomach divided into several pockets. They live in rivers, on roots and other vegetable substances, and evince much ferocity and stupidity. We know but one species at present, confined to the rivers in Africa. M. Cuvier says that it formerly came by the Nile to the south of Egypt, but has long disappeared in that country. Burckhardt tells us that they are common in Dongola, and that one had lately descended the Nile beyond Assouan. Fossil bones of the Hippopotamus are very common in Tuscany, but it is not yet discovered if they are of a living species, or of one that is lost; the bones of a very small species of Hippopotamus, now extinct, have been found in France.

(2) Their incisives vary in number, but the lower always project; the canines pass out of the mouth, and all curve upwards; the muzzle is terminated by a truncated snout for digging up the ground; the stomach is a little divided.

(3) Their fecundity far surpasses that of all other animals of the same size, the Sow sometimes producing fourteen young ones. It is pregnant four months, and twice a-year. The Hog (Sus scrofa. *L.*) grows from five to six years, produces young when a year old, and lives twenty. Although very brutal in its nature, the Hog is a social animal, and they defend themselves against wolves by forming themselves into

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a circle, and presenting their snouts on all sides; they are so voracious that they do not even spare their young. Sus larvatus. S. barbirussa.

(4) They have only two incisives above, but six below. The individuals brought from Cape Verd (S. Africanus, *Gm.*) generally have their incisives complete; those which come from the Cape of Good Hope (S. Ethiopicus, *Gm.*) scarcely ever have any; sometimes, only, we find vestiges of them under the gum.

(5) The bones of the metatarsus and metacarpus of their two great toes are soldered together in a sort of cannon, as in the Ruminantia, and their stomach is also divided into several pockets. We frequently find their aorta very much swelled, but not always in the same place, as if they were subject to a kind of aneurism. We know but two species; Linnæus confounds them under the name of Sus Tajassu.

(6) This animal shews the most singular affinities to the different tribes of Pachydermata, and yet is connected in some respects with the order of Ruminantia. Their feet, terminated by two large toes, as in the Ruminantia, have this difference, that the bones of the metatarsus and metacarpus remain separate, without being soldered into a cannon. The composition of their tarsus is the same as in the Camel. The bones of this genus have hitherto only been found in the lime-quarries of Paris. We have already recognised five species from thence, one as large as a small ass, with the low form and long tail of the otter, A. Communis, *Cuv.*; its fore-feet have a small accessory toe on the inner edge: one of the size and slight appearance of the Gazelle, A. Medium: and one of the size and pretty nearly of the proportions of a hare, with two small accessory toes on the sides of the hind feet, etc.

(7) The nature of these animals is stupid and ferocious; they prefer humid places, live on herbs and branches of trees, have a simple stomach, very long intestines, and a very large cæcum. The Rhinoceros of India, besides its 28 grinders, has 2 very strong incisive teeth in each jaw; 2 additional small ones between the two lower incisives, and 2 still smaller outside the upper incisives. It has but one horn, and its skin is remarkable for the deep folds behind and across its shoulders, and before and across its thighs. The Rhinoceros of Sumatra, with the same four large incisives as the preceding, has scarcely any folds in the skin, and bears a second horn behind the other. The Rhinoceros of Africa has two horns like the preceding, no folds in the skin, and no incisive teeth; its grinders occupy almost the whole length of its jaw. In Siberia and different parts of Germany, the bones of a Rhinoceros with two horns have been found under ground, the head of which, much longer than that of any living Rhinoceros, is further distinguished by a vertical bony partition which sustains the bones of the nose. It is an extinct species, and a corpse of it almost entire, taken out of the icé on the borders of the Vilhoui in Siberia, has shewn that it was covered with a tolerably thick hair. It might, therefore, have lived in the north like the fossil Elephant.

Some other bones of the Rhinoceros have more recently been dug

up in Tuscany and Lombardy, which appear to be much nearer to those of the African.

(8) These animals have short muzzle and ears, and are covered with hair. Their stomach is divided into two pockets, besides a large cæcum and several dilatations of the colon; there are two appendages towards the middle of the latter, analogous to the two cæcums of birds. We know but one species, as large as a Rabbit, common on all the rocks of Africa, the Hyrax Capensis et Syriacus.

(9) M. Cuvier discovered the bones of this genus mingled with those of the Anoplotherium in the lime quarries in the environs of Paris, and they exist in several other places in France. There are eleven or twelve species known; five have been found at Paris alone, one the size of a Horse, two the size of a Tapir, and two that of a small sheep; the bones of one species, found near Orleans, nearly equalled the Rhinoceros. These animals appear to have frequented the borders of lakes and morasses, for the stones which contain their bones also contain fresh-water shells.

(10) Buffon, considering that almost all the Mammalia were known, established it as a general rule, that the animals of the southern countries of the New World were unknown in the Old. The Tapir, especially, appeared to him to be an animal singular in its nature, and the type of a Genus exclusively peculiar to America, in confirmation of the general rule he had adopted. A species called Maiba, however, has lately been discovered in Sumatra and the forests of Malacca, only differing from that of America in colour; the number of its toes and teeth are the same. The Mussulmen do not eat its flesh, regarding it as a species of pig; that in the Menagerie of the Marquis of Hastings is very tame, and fond of being caressed. Its height to the shoulder is two feet eight inches, and its length three feet three inches.

FAMILY III. SOLIPEDA.

GENERA.

1. Equus. (1)

6 incisives to each jaw, the crowns hollow in early age; 6 grinders with square crowns, marked by the plates of enamel, which form 4 crescents, and in the upper grinders present a small disk, in addition, on the internal edge. Pl. 9, fig. 1, 8.	The males have two small canines in the upper jaw (sometimes in both), which are almost always wanting in the females.

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(1) The stomach of the horse is simple and moderate in size, but its intestines are very long, and their cæcum enormous. The mammæ are between the thighs. The age of the Horse is best known by the incisives. They first begin to appear fifteen days after birth, at two years and a half the middle ones are replaced, at three and a half the two next, at four and a half the two exterior, called the corner teeth. All these teeth have a hollow crown at first, which they gradually lose by use. At seven and a half, or eight years, all the hollows are effaced, and the age of the horse is marked by the crowns of the incisives becoming more and more triangular. The lower canines appear at three years and a half, the upper at four; they remain pointed until six; at ten they begin to grow loose and expose their roots. The Horse rarely lives beyond thirty years. Its principal races have sensible differences in the form of the head, and in their proportions; they are each characterised by a preference for different employments. The most slender and the fleetest are the Arabian Horses, which have aided in perfecting the Spanish race, with which they have contributed to form the English. The largest and strongest come from the coasts of the North Sea; the smallest from Sweden and Corsica. The wild Horses have a large head, shaggy hair, and are not well proportioned. The Dziggetai (Equus Hemionus, *Pall.*) forms the medium between the Horse and the Ass (it is probably the wild mule of the ancients), and lives in numbers in the sandy deserts of the centre of Asia. The hoarse voice or bray of the Ass proceeds from two small peculiar cavities at the bottom of the larynx. Equus Zebra, *Lin.*, Equus Quaccha, *Gm.*

ORDER VII.

Ruminantia.

This order is perhaps the most natural and the best determined of the class of Mammalia, for its animals have the appearance of being almost all constructed on the same model; the camels alone presenting some small exceptions to the common characters. The first of these characters is that of having incisives only in the lower jaw, the number almost always eight; they are replaced above by a callous pad. Between the incisives and grinders is an interval, where we find, in some Genera, one or two canines. The grinders, almost always six in each jaw, are marked on the top with two double crescents, the convexities of which are directed inwards in the upper jaw and outwards in the lower; pl. 3, fig. 5.

The feet are terminated by two toes and two hoofs, which are flattened on the sides next to each other, so that they appear as if one hoof only, which had been split; these animals are for this reason called fork-footed or bifurcated.

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Behind the hoofs there are sometimes two little spurs, the only vestiges of lateral toes. The two bones of the metacarpus and metatarsus are united in one, which bears the name of cannon; pl. 8, fig. 7.

The name of Ruminantia indicates the singular property of these animals to chew their food a second time, by bringing it back into their mouths after the first deglutition; a property owing to the structure of their stomachs, of which they have always four; the three first are so disposed that the food enters at the pleasure of the animal into either of the three, the œsophagus ending at the point of communication.

The first and largest is called the paunch, and receives in abundance the herbs rudely bruised by the first mastication; thence they pass to a second called the honey-comb, the cells resembling that structure: this stomach, very small and globular, imbibes and compresses the grass into little balls, which afterwards reascend successively to the mouth to be remasticated. The animal reposes during this operation, which continues until all the grass first collected in the paunch has been subjected to it. The aliments, thus chewed a second time, descend immediately into the third stomach called the feck, the partitions of which are longitudinal plates like the leaves of a book, and from the feck into the fourth stomach, or the reed, the cells of which merely present wrinkles: this last is the true organ of digestion, analogous to the simple stomach of other animals; see pl. 3, fig. 11. Whilst the Ruminantia suck and live on milk, the reed is the largest of their stomachs; the paunch developes itself and assumes its enormous size only in proportion as it receives the grass. The intestinal canal of the Ruminantia is very long, but not much swelled out in the large intestines: their cæcum is long and tolerably smooth. The fat of these animals indurates more in growing cold than that of other quadrupeds, and even becomes brittle; it is called suet. The mammæ are placed between the thighs.

The Ruminantia are, of all animals, the most useful to Man; he may eat of them all, and it is from them that he procures almost all the flesh with which he nourishes himself. Several serve him as beasts of burthen, whilst others are useful for their milk, their suet, their leather, their horns, and other productions.

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ORDER VII. RUMINANTIA.

GENERA.

Without horns.

1. Camelus. (1)

Canines in both jaws; 2 teeth in the incisive bones of the upper, and 6 in the lower.	18 or 20 grinders.	The only Ruminantia with the cuboid and scaphoid of the tarsus separate.

Sub-genera.

1. Camel. The 2 toes united underneath almost to the ends.	A hunch or hunches of fat on the back.
2. Lama. (2) Peruvian Camel. The 2 toes separate.	No hunch.

2. Moschus. (3) Musk.

A long canine on each side in the upper jaw, which extends out of the mouth in the males.		The only Ruminantia with a fibula.

Males, or Males and Females with horns. (4)

With solid horns.

3. Cervus. Deer.

The horny substance a thick bone, without pores or cells; horns deciduous.	Females without horns, except the Rein Deer.	Lachrymals, or folds of skin under the eye, with a correspondent hole in the skull.

Sub-genera.

1. Horns presenting more or less of a flat surface. Pl. 11, fig. 8. (5)
2. Horns round. (6)
3. Horns small in proportion. (7)

4. Giraffe. Camelopardalis. (8)

Both sexes with conical horns covered with skin, which never fall.	A bony tubercle on the forehead.	Neck and fore legs disproportionately long.

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With hollow horns.

The frontal process on which the horns are fixed (as sheaths) without pores or cells.

5. Antelope. (1)

The lachrymals, figure, and speed of the Genus Cervus.

Subdivided into
1. Horns with rings, curving twice or thrice and pointed forwards, backwards, or upwards. Pl. 11, fig. 9. (10)
2. .. .. curving twice, but in a contrary sense to the preceding, pointed backwards. Pl. 11, fig. 10. (11)
3. .. .. straight or very little curved. (12)
4. .. .. a simple curve pointed backwards. (13)
5. .. .. forwards. (14)
6. .. with spiral branches. (15)
7. .. smooth. (16)

The frontal process, etc. filled with cells communicating with those of the forehead.

6. Capra. (17)

Horns directed backwards.	Forehead concave.	Generally a long beard.

7. Ovis. (18)

Horns spiral, directed backwards, and recurving towards the front.	Forehead generally convex.	No beard.

8. Bos. (19)

Horns directed sideways, and then curving upwards or forwards, like crescents. Pl. 15.

(1) The lip of the Camel is swollen and cleft; its long neck, projecting orbits, the weakness of its croup, the disagreeable proportion of its legs and feet, make it in some measure a deformed being; but its extreme temperance, and its faculty of passing several days without drinking, render it of the greatest utility: this probably proceeds from the number of cells in the sides of its paunch, and in which water is retained or continually produced; no other Ruminantia have this formation or faculty. A fœtid humour runs from their head during the rutting season. The Camel with two humps (Camelus Bactrianus, *Lin.*) is originally from the centre of Asia, and does not descend near so far to the south as the Camel with one hump (Camelus Dromedarius, *Lin.*), which is spread from Arabia into all the north of Africa, and a great

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part of Syria, Persia, etc. The Camel with two humps goes better in humid soils, and is larger and stronger than the other. When it changes its coat, it is for a time entirely divested of hair. The Camel with one hump carries its temperance the furthest. The Dromedary is a lighter and swifter variety, and fitter for riding on.

(2) There are only two species of these animals, both in the New World, and much smaller than the preceding. The Guanaco (Camelus Llacma, *Lin.*), as large as a stag; it was the only beast of burden in Peru when it was conquered; it will carry 150lbs. weight, but only makes short journies in the day. The Vigogne, or Paco (Camelus Vicunna, *Lin.*), is covered with tawny-coloured wool, which affords precious stuffs; it hangs in long hairs under the breast.

(3) The Musk, (Moschus Moschiferus, *Lin.*), is the most celebrated species. The pocket of the male, situated before the prepuce, is filled with that odoriferous substance so well known in medicine and perfumery.

(4) All other Ruminantia, at least the males, have two horns, that is to say, two eminences of the frontal bones which are not found in any other family. In some, these eminences are enclosed in a case of an elastic substance, composed of agglutinated hairs, which increase by layers during their whole life, as do the eminences also, which never fall; such are the horns of Oxen, Sheep, Goats, and Antelopes. In others, these eminences are only enveloped in a hairy skin, which is a continuation of that of the head, and which is not destroyed; these eminences also never fall, and are found only in the Giraff. Lastly, in the Genus Cervus the eminences are covered for a long time with a hairy skin like that of the rest of the head, and have at their base a ring of bony tubercles, called the burr; which, enlarging, compress and obliterate the nourishing vessels of this skin. The skin dries and falls off, leaving the bony eminences naked, which after a time separates from the head, fall, and leaves the animal without defence. New horns, however, soon shoot forth, generally larger than the preceding, and destined to undergo the same revolutions. These horns, of simple bone and subject to periodical changes, bear the the name of *The Wood.*

(5) The Elk, or Elend, (C. Albes, *Lin.* Moose-deer. Orignal). The wood of the male, at first like a dagger, at the age of five years assumes the form of a triangular plate dentated on the external edge, and borne upon a pedicle. It increases with age, until it weighs fifty or sixty pounds, and has fourteen antlers on each horn. The Rein-deer (C. Tarandus, C. Dama), which is the Platiceros, and not the Dama of the Ancients.

(6) The common Deer (Cervus Elaphus). The wood of the male

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is round and appears the second year, at first in the form of a dagger, afterwards assuming branches or antlers in proportion as it advances in age. When very old, the male deer becomes black, and the hairs of his neck elongate and become rough; and it is then the Hippelaphos of Aristotle. The wood falls in the spring, and returns during the summer; during this time the animals live separately.

(7) (Cervus Pygargus, *Pall.* C. Muntjac, *Gm.*) America also produces different species of Roebucks, but which have been hitherto badly characterised. As they are all from the warm parts of the country, they do not change colour, and have no fixed periods for the renewal of their wood. The wood of the celebrated Fossil Elk of Ireland surpasses that of any Elk now known, in all its dimensions. M. Cuvier observes, in his *Fossil Remains*, that it resembles the head of the Cervus, and not that of the Elk; (see pl. 15, fig, 4) and amongst other distinctions he adds, that the fossil has from 16 to 20 antlers only, whilst those of the Elk generally amount to 30 or more; neither is the antler at the base of the branch of the Fossil, descending to the forehead, found in the Elk. The upper part of a skull of the Genus Cervus, with two stumps of horns, dug up near Paris, from the position of the first antler (indicated by the rupture), the elevation between the two horns, and the proportional width of the forehead, appears to be of the Genus Cervus, and analogous to the Fossil Elk; see pl. 15, fig. 11; but from the fragments of the bones of the pelvis and calcaneum, it seems to have been only four feet high to the withers, whilst the former is calculated by M. Cuvier to have been $6\frac{1}{2}$ feet high to the withers, and 12 feet long;

(8) There is but one species known, confined to the deserts of Africa. It is the tallest of all animals, being 18 feet high from the feet to the the top of the head; is of a very gentle nature, and feeds on the leaves of trees. The Romans had living Giraffs in their games. Zerafa means elegant in Arabic.

(9) The name of Antelope is not ancient; it is corrupted from Antholophos, which we find in Eustathius, an author of the time of Constantine. The common Gazel has been well described by Elian, under the name of Dorcas. Gazel is Arabic, and perhaps the diminutive of Gaz, Goat.

(10) The Gazel (Ant. Dorcas, *Lin.*). The sweetness of its countenance furnishes the amorous poetry of the Arabs with numerous images. Ant. Corinna, *Gm.* is perhaps only a variety. Ant. Kevella, *Gm.* etc.

(11) The Bubalus of the Ancients (Ant. Bubalis, *Lin.* Ant. Caama, *Cuv.*).

(12) Ant. Oryx, *Pall.* or Chamois of the Cape. As large as a stag, with thin horns two or three feet long. This singular animal is the

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Oryx of Ælian, and it is probably from one of these individuals, which had lost a horn, that the Unicorn is derived.

(5) Ant. Leucophæa, *Gm.*, commonly Blue Goat. Ant. Equina, *Geoff.*

(6) The Nanguer (Ant. Dama, *Lin.*), probably the Dama of Pliny.

(7) The Canna (Ant. Oreas, *Pall.*) 'Elan of the Cape' of the Dutch. The Coudous, (Ant. Strepsiceros, *Pall.*).

The Nylgau (Ant. Picta, et Trago-camelus). The Chamois (Ant. Rupicapra, *Lin.*), Ysard in the Pyrenees; the only one of the Ruminantia of the west of Europe which may be compared to the Antelope; it has, however, peculiar characters: the points of its straight horns are suddenly curved backwards like a fish-hook; behind each ear and under the skin is a bag, which only opens outwards by a small hole. The Gnou or Nion (Ant. Gnu, *Gm.*). Both sexes have horns, and live in the mountains to the north of the Cape. It is somewhat rare, and yet the Ancients had some knowledge of it, and it is probably the animal which gave rise to their Catoblepas. See Pliny.

(9) The Wild Goat (Capra Ægagrus, *Gm.*), appears to be the parent of all the varieties of our domestic goats. It dwells in troops in the mountains of Persia, where it is known under the name of Paseng, and perhaps in those of several other countries, even in the Alps. The oriental bezoar-stone is a concretion found in its intestines. The goats of Angora in Cappodocia have softer and more silky hair. The goats of Guinea and of Whydah are very small, and their horns directed backwards. (Capra Ibex, *Lin.* Capra Caucasica.)

To this day we have scarcely any other characters for separating Goats from Sheep, than the concavity of the forehead and beard in the former, and the convexity of this part of the head and the smooth chin of the latter. The Egyptian Goat, however, has a much more convex forehead than any sheep; and it is entirely destitute of beard. From the length of its legs we might take it for that extraordinary variety of Sheep of which Buffon has spoken, under the name of Morvan; in short, were it not for the disagreeable odour which it exhales, it would not be possible to decide to which Genus it belongs, the Sheep or the Goat. The head and face of the female has not the characteristic outline so strongly marked as the male; see the head of the latter, pl. 14, fig. 1; but when a mother, her mammæ hang so low down and are so voluminous, that they almost touch the ground, and hinder her from walking; they are pendant from a very long fleshy pedicle, and when they are full resemble two spheres attached to each other. The milk is very sweet and abundant. Its ears are so large that they cover its eyes when its head is inclined, for which reason their pursuers generally take them going down hill. M. Frederic Cuvier justly observes on this occasion, that Naturalists ought to consider the study of varieties much more important than that of species, as being more connected with causes and effects; that no natural Genus presents specific differences so marked as those in the varieties amongst our domestic animals. The Lion and the Tiger do not differ more from each

other, than the Spanish Cat differs from that of Angora; the Wolf and the Jackal have a hundred times more resemblance than the Mastiff and Greyhound. It is the same with the Mouflou and the Argali, compared to the Morvan and Merinos; and the Egagne may be more easily confounded with the Ibex, than the Cachemire Goat with that of Egypt.

(10) They have so little claim to be generically separated from Goats, that they breed together and produce prolific offspring. There are several races, or wild species, nearly approaching each other. The Argali of Siberia (Ov. Ammon, *Lin.*), which inhabits all the mountains of Asia, and becomes as large as a deer. The Mouflon, or Mufione of Sardinia, Muffoli of Corsica. There is reason to believe that the Mouflon of America (Ov. Montana), is a species of Argali, which has passed the sea on the ice. The Mouflon of Africa (Ov. Tragelaphus) inhabits the rocky districts throughout Barbary, and M. Geoffroy has seen it in Egypt. It is from the Mouflon, or from the Argali, that we may derive the innumerable races of our woolly animals, which, next to Dogs, present the greatest varieties. The most interesting varieties are those of Spain (with fine curly wool, and with large spiral horns in the males), which begin to be spread all over Europe; and those of England with fine long wool. The most prevailing variety of Southern Russia has a very long tail. Those of India and Guinea have their tails somewhat long; and are distinguished by their long legs, very convex forehead, hanging ears, want of horns, and thin hair instead of wool. The north of Europe and Asia has small sheep, almost always with a very short tail. The Persian, Tartarian, and Chinese races have the tail entirely transformed into a double globe of fat; those of Syria and Barbary have a long tail; but it is also loaded with a thick mass of fat. The ears are pendent; the horns of the rams are thick; those of the wethers and sheep moderate; the wool is mixed with hair. The sheep is every where precious for its flesh, its suet, its milk, its skin, its hair, and its dung; its flocks well managed carry fertility every where. The lamb is weaned at two months; is castrated at six and changes its first teeth between one and three years. The Ewes produce at a year old, and are fertile until ten or twelve; its gestation is five months. The Ram reaches puberty at 18 months; suffices for 30 sheep, and is fattened at 8 years.

(11) The Common Ox (Bos Taurus, *Lin.*). The ordinary races of the torrid zone have a hunch of fat on the shoulders, and some are scarcely bigger than a hog. The Cow goes with young 9 months, and produces at the age of eighteen; the Bull at two years. The Bull should be cut at 18 months or 2 years, and be fattened at 10 years. The Aurocks of the Germans, Zubr of the Poles, Bos Urus of *Gm.*, Urus or Bison of the Ancients, generally, but erroneously, passes for the wild stock of our horned beasts. It is distinguished by a vaulted forehead, wider than it is big; horns attached below the occipital crest, pl. 15, fig. 8, 9, 10, 12, 14; by the height of its legs; by an additional pair of ribs; by a sort of curly wool which covers the neck and head

of the male, forming a short beard under the throat; and by a grunting voice. It is a savage animal, which has taken refuge in the large marshy forests of Lithuania, Crapac, and Caucasus; but which formerly inhabited the whole of temperate Europe. It is the largest of quadrupeds after the Rhinoceros. The Bison of America, Buffalo of the Anglo-Americans (Bos Bison, *Lin.* Bos Americanus, *Gm.*), has not as yet been sufficiently compared with the Aurochs; its legs and tail appear to be shorter, the hair of its head and beard longer, etc. It inhabits all the temperate parts of North America. The Buffalo, (Bos Bubalus, *Lin.*) is originally from India, was brought into Egypt, Greece, and Italy during the middle ages, and unknown to the Ancients; it has a vaulted forehead, of a greater depth than width, and its horns directed sideways; pl. 15, fig. 13, 15.

It is very difficult to tame, but of great vigour; it prefers marshy places, and the coarse herbage which the Ox refuses. Its milk is good; its leather very strong, but its flesh very little esteemed. There is a race in India with horns, sometimes measuring 10 feet from tip to tip; it is called Arni in Hindostan. The Yack (Bos Grunniens, *Pall.*), or Buffalo with a horse's tail, Grunting Cow of Tartary, etc. is a small sized species, the tail of which is entirely furnished with long hair; it has also a long mane on the back; its head appears to resemble that of a Buffalo, but its horns have not been sufficiently described. This animal, mentioned by Ælian, is originally from the mountains of Thibet. The standards which are used by the Turks to distinguish their superior Officers, were first made with the tail of this animal. The Cape Buffalo (Bos Caffer) is a very large animal of a very ferocious disposition, and inhabits the woods of Caffraria. The Musk Bull of America (Bos Moschatus, Gm.). It emits more strongly the musky smell common to all this Genus; it is only found in the coldest parts of North America; but it appears that its skull and bones have sometimes been carried by the ice as far as Siberia. The Esquimaux make caps with its tail, the hair of which, falling over their face, defends them from Musquitoes. See pl. 15, fig. 9 and 10, for the heads of Fossil Oxen with horns differently directed, and much longer than those of the existing species.

ORDER VIII.

Cetacea.

The Cetacea are Mammalia with not hind-feet; their trunk is prolonged by a thick tail, which terminates in a cartilaginous horizontal fin, and their head is joined to the trunk by a neck so short and thick that we do not perceive any diminution of size. It is composed of very thin cervical vertebræ, partly soldered together. Their anterior extremities are formed of short flat bones, enveloped in

a tendenous membrane, which reduces them to the true fins. They have almost entirely the form of Fish, except that the fin of the tail of the latter is vertical. The Cetacea, therefore, are constantly in the water; but, as they breathe by lungs, they are often obliged to return to the surface to inspire the air. Their warm blood; ears with an exterior, although very small, opening; their viviparous generation, and their anatomy, sufficiently distinguish them from Fish.

Their brain is large, and its hemispheres well developed; the os petrosum, or that part of the skull which contains the internal ear, is separated from the rest of the head, and only adheres to it by ligaments. They never have exterior ears, or hair on their bodies.

The form of their tail obliges them to bend themselves from above to below for their progressive movement in the water, and aids them considerably in rising to its surface.

ORDER VIII. CETACEA.

FAMILIES.

1. Herbivora. (1)

Teeth with flat crowns.	2 mammæ on their breast. Hairy whiskers.	Nostrils pierced at the end of the muzzle in the skin, but much higher in the skull.

2. Cete. (2)

Teeth conical or none.	Mammæ near the anus. Smooth skin, no vestige of hairs.	Spiraculæ.

Sub-genera.
1. Head in proportion to the body.
2. Head disproportionately large, being half or a third the length of the whole body.

(1) When they raise the upper part of their bodies vertically from the water, their mammæ and whiskers give them, at a distance, some resemblance to men and women, which has probably given rise to the fables of the Tritons and Sirens.

(2) These are distinguished from the preceding by a singular apparatus, which has given them the common name of blowers and spouters. In swallowing their prey, large volumes of water enter into their enor-

mous mouth, and which they are obliged to discharge. It passes into the nostrils by a peculiar disposition of the covering of the palate, and is collected in a bag placed at the exterior orifice of the cavity of the nose, whence it is expelled by the compression of powerful muscles through a very narrow opening pierced above the head. It is thus that they produce those jets d'eau which are seen at a distance by sailors. Their nostrils, unceasingly washed with salt water, cannot be furnished with a membrane delicate enough to be sensible of smell, for which reason they have not the projecting laminæ of other animals; the olfactory nerve is very small, and if they do enjoy the sense of smell it must be in an extremely small degree. Their larynx, in the form of a pyramid, penetrates into the hinder nostrils to receive the air and conduct it to the lungs without the animal having occasion to raise its head and mouth out of the water; there are no projecting scales in their glottis, and their voice is reduced to simple murmurings. They have no vestige of hairs, but their whole body is covered with a smooth skin, under which is the thick lard abounding in oil, the principal object of the fishery. Their mammæ are near the anus, and they cannot seize any thing with their fins. Their stomach has five, and sometimes even seven distinct pockets; and instead of a single spleen they have several, small and globulous. The teeth are all conical and similar; they do not masticate their food, but swallow it rapidly. Two small bones suspended in the flesh near the anus are the only vestiges of posterior extremities. Several have a vertical fin on the back, of a tendinous substance, but not supported by bones. Their eyes, flattened in front, have a thick and solid sclerotica; their tongue has only smooth and soft teguments.

FAMILY I. HERBIVORA.

GENERA.

1. Manatus. Lamantin. (1)		
8 grinders on each side, with flat crowns, marked with 2 transversal ridges. No incisives or canines in the adults. Pl. 14, fig. 6, 7.	Vestiges of nails on the edge of the fins.	Body long. Tail terminated by a fin in the form of a crescent.
2. Halicore. Dugong. (2)		
Grinders resembling 2 cones joined at their sides. Incisives large and tusk-like, but covered by the lips. Pl. 13, fig. 3.	Lips fleshy and hairy.	

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3. Stellera. Rytina. (3)

1 grinder on each side, with flat crowns and projecting plates of enamel.

No nails on the fins.

(1) They are sufficiently dexterous with their fins to creep along and carry their young, which has caused these members to be compared to hands, and originated the name of Manates, whence, by corruption, that of Lamantin. Their stomach is divided into several pockets, their cæcum into two branches, and they have a swelled-out colon; all herbivorous characters. They are called Marine Cows on account of their manner of life, and Marine Women, etc., on account of their mammæ. Trichechus Manatus, *Lin.* It would appear that those in the rivers of America differ specifically from those of Africa; pl. 14, fig. 7. They attain sometimes even more than fifteen feet in length. Their flesh is good to eat.

(2) We know but one species, which inhabits the Indian Seas, and which has been confounded by several travellers with the Lamantin. They are also called Siren, Marine Cow, etc.

(3) According to Stetler, who first described these animals, their stomach is much more simple than that of the Manatis. There is but one species known, which is found in the northern part of the Pacific Ocean.

FAMILY II. CETE.

DIVISION I.

GENERA.

1. Delphinus.

Teeth in both jaws, simple and conical.

Sub-genera.

1. Delphinus proper. (1)
The muzzle prolonged and narrowed into a beak.

2. Phocæna. (2)
Muzzle short and enlarged.

3. Delphinaptera. (3)
Muzzle as Phocœna, but no dorsal fin.

4. Hyperoodon. (4)
Muzzle resembling Delphinus Proper, but only 2 small teeth, not always visible, before the lower grinder; and their palate armed with small tubercles.

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2. Narval. Monodon. (5)

No teeth, except strong straight and pointed tusks in the intermaxillary bone.	The head and body much resembling those of the Phocœna.

(1) The Delphinus Delphis, *Lin.*, armed on each side of its jaw with from 42 to 47 slender teeth, crooked and pointed, appears to be the Dolphin of the ancients. The organisation of its brain proves that it cannot be destitute of the docility which they attribute to it. The Delph. Rostratus, *Shaw*, has 21, 22, or 23 conical teeth on each side.

(2) The Porpoise of the English (Delph. Phocœna, *L.*), is the smallest of the Cetacea, and only attains from four to five feet in length. The Schwerdt-fisch of the Dutch, Grampus of the English (Delph. Orca and Delph Gladiator), the largest of all Dolphins, is often from 20 to 25 feet in length, and is the most cruel enemy of the Whale. They attack it in numbers, teaze it till it opens its mouth, and then devour its tongue.

(3) The Beluga or Epaulard blanc (Delph. Leucas, *Gm.*, Delph. Albicans, *Fabr.*).

(4) We know but one species, which attains from 20 to 25 feet in length; it has often been called the Whale with a beak.

(5) There is but one species known, Monodon Monoceros, *Lin.* This animal has the germs of two tusks, but they rarely grow equally; generally only that of the left side is developed, and the other remains hidden for life.

DIVISION II.

GENERA.

1. Physeter. Cachalot. (1)

Head exceedingly enlarged in the fore part; the upper jaw without teeth, or at least with very small ones.	Lower jaw with a row of cylindrical or conical teeth.

Sub-genus. 1.—With a dorsal fin. (2)
2.—With a callous eminence instead of a dorsal fin.

2. Balæna. (3)

Head not so large in the fore part as the Physeter. No teeth, but the upper jaw, in the form of a keel, furnished on each side with close thin plates, called elasmiæ or whiskers.	Lower jaw without teeth.

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Sub-genera.
1. BALÆNA PROPER. (4) Without a dorsal fin.
2 BALÆNOPTERA. With a dorsal fin.

Sub-divisions.
1. The belly sleek and smooth. (5)
2. The belly with wrinkles or folds. (6)

(1) The upper part of their enormous head consists almost entirely of large cavities, covered and separated by cartilages, and filled with an oil which coagulates on cooling, and which is known in commerce under the whimsical name of spermaceti; this substance forms the principal profit of the fishery, their body not being furnished with much lard. These cavities are very distinct from the true skull, which is somewhat small, placed behind them, and contains the brain as usual. It appears that these canals filled with spermaceti, otherwise called adipocre, are distributed in several parts of the body, communicating with the cavities which occupy the mass of their head; they exist even in the common lard under the skin. The odoriferous substance well known under the name of ambergris, appears to be a concretion formed in the intestines of the Physeter, especially in certain diseased states, and it seems principally to accumulate in the cæcum. The species of the Physeter are very imperfectly determined; the most common appears to be the Cachalot Macrocephala of Shaw and Bonnaterre, which has only a callous eminence instead of a dorsal fin.

(2) We find these Physetera in the Mediterranean as well as in the Frozen Ocean; those of the latter are said to be the greatest enemies of the seal.

(3) The whiskers of the Balæna are formed of a species of fibrous horn, called whalebone, unravelled at the ends, and which serves to retain the small animals on which these enormous Cetacea feed. Their lower jaw contains a very thick fleshy tongue, and, when the mouth is shut, envelopes all the interior part of the upper jaw and the horny plates with which it is furnished. These organs do not allow the Whale to feed on animals as large as we might expect from their size. They live on fish, and still more on Worms, Mollusca, and Zoophytes; indeed they are said principally to take the very small ones which entangle themselves in their whiskers. They have a short cæcum.

(4) The Bal. Mysticetus is the largest of all known animals. It formerly ventured to our seas, but it has retired by degrees far to the north, where its numbers daily diminish. Each individual has 8 or 900 whiskers on each side of its palate. It attains 80 or 100 feet in length, and as many in circumference; the opening of its mouth is 20 feet, and its young are of that length at the moment of their birth. A single individual yields a hundred barrels of oil. Shells attach and multiply themselves on its skin as on a rock; there are even some (of the family of Balanus) which penetrate into it: its excrements are of a beautiful

red, which serves for dying. The φαλαινα of Aristotle and Ælian, which was the enemy of the Dolphins, appears to have been a large Cetacea, armed with teeth. Aristotle knew but one true Whale, his Mysticetus, which had bristles in its mouth instead of teeth, and is probably the 'Whale with the wrinkled throat' of the Mediterranean. We must believe, however, that Juvenal meant the Mysticetus in this line:—

Quanto Delphinis balæna Britannica major;

But the Latin authors in general have applied the name of Whale in a vague manner to all the large Cetacea, as the people of the North still apply that of whale or wall and its derivatives; a remark which is essential to those who read their writings. The Nord Caper, Bal. Glacialis, *Klein.*, is as long, but thinner, and has a more pointed muzzle than the Whale. It has much less lard, is more agile and difficult to take, and its fishery is only carried on when that of the other has not succeeded. It is common on the coasts of Norway and near Cape North, from whence it takes its name. It devours quantities of fish.

(5) The Gibbar (Balæna Physalus, *L.*, Finn-fisch of the Dutch and Hamburghers), as long but much thinner than the Mysticetus, is very common in the same tracks, but avoided by the fishermen because it gives but little lard, and is very ferocious and difficult to take; indeed it is dangerous to small vessels on account of the violence of its movements when attacked.

(6) These have the skin below the throat and breast folded longitudinally in very deep wrinkles, and consequently susceptible of great dilatation, the use of which in their economy is not yet well known. There has been but one species clearly determined, the Jubarte des Basques, (Bal. Boops, *L.*) which is said to approach the length of the Mysticetus, but which has all the inconveniences of the Gibbar; it is taken in the Mediterranean as well as in the Ocean. Pl. 12, fig. 1.

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PART II.

THE SYSTEM OF ILIGER.

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THE ORDERS AND FAMILIES OF MAMMALIA.

Mammalia are vertebrated animals, breathing with lungs, with warm red blood, a heart with two ventricles and two auricles, a diaphragm, mammæ, a skin either hairy or bald, viviparous, giving milk.

SYNOPSIS OF THE ORDERS.

A. Feet exterior, distinct.

a. Hands or feet with a distinct thumb or great toe, with a flat nail or without a nail.

1. The hand only with an opposable thumb. Upright walk. Entire sole of the foot set to the ground in walking ..... I. Erecta. Family 1.

2. The hind feet always, and the fore feet generally, with opposable great toes..... II. Pollicata. Families 2-6.

b. Feet with no distinct great toes.

3. Feet for springing. Toes with hooked nails, two toes on the hind feet joined together. An abdominal pouch, 6 or 8 incisives above, 2 below. Canines either wanting or doubtful. Grinders laminar ..... III. Salientia. Family 7.

4. Toes with hooked nails, sometimes with larger nails enveloping both sides of the foot like small hoofs. 2 incisives, and a void interval in place of the canines. Grinders simple,* complicated,† or laminar §..... IV. Prensiculantia. Families 8-15.

* Simple Grinders are those in which the bony substance of the tooth has only an exterior envelope of enamel, as the grinders of Men and Apes. Pl. 3, fig. 6, 7.

† Complicated Grinders are those in which the folds of enamel are intricately blended with the bony substance, irregularly dividing the crowns of the teeth. Pl. 5, fig. 4.

§ Laminar Grinders are those in which the bony and vitreous substance or enamel are so connected that the crowns of the teeth appear to be intersected by perpendicular plates. Pl. 9, fig. 2. Pl. 5, fig. 9.

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5. Feet with 3-5 obtuse or flat nails. Incisives and canines various, the one or the other generally wanting. Grinders complicated or laminar ..... V. MULTUNGULA. Families 16-21.

6. Feet with one entire nail. Grinders abrupt ..... VI. SOLIDUNGULA. Family 22.

7. Feet bifurcated, or subbifurcated.* No upper incisives to those with bifurcated feet, a few to the subbifurcated, 6-8 lower incisives to both. Grinders abrupt, complicated ..... VII. BISULCA. Families 23-26.

8. Toes with hooked nails. No incisives. Canines solitary. Grinders simple ..... VIII. TARDIGRADA. Family 27.

9. Toes either with hooked nails, or approaching to flat. No incisives or canines. Grinders either smooth, fibrous, or a toothless bone. IX. EFFODIENTIA. Families 28-29.

10. Toes with hooked nails. No teeth, or teeth without roots. No mammæ. A cloaca .. X. REPTANTIA. Family 30.

11. Toes with hooked nails. Flying membrane from the fore to the hind feet, proceeding from the sides of the body, and interfemoral, i.e. connecting the hind legs and joining the anus. Incisives, canines, and simple grinders.. XI. VOLITANTIA. Families 31-32.

12. Toes with hooked nails. Feet for walking or digging, or palmated; the upper parts of the legs almost within the body, and the extremities nearly enveloped in skin; the hind feet lateral. Incisives, canines, and simple grinders. XII. FALCULATA. Families 33-36.

B. Feet with the upper parts entirely within the body, the extremities enveloped in skin, the hind feet either turned backwards, forming a tail, or wanting.

13. Feet palmated, hind feet distinct, and turned backwards ..... XIII. PINNIPEDIA. Family 37.

14. Hind feet within the tail, or none; the fore feet reduced, and enveloped like fins ..... XIV. NATANTIA. Families 38-39.

* As the Camels. See Note to p. 77.

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SYNOPSIS OF THE FAMILIES.

I. Erecta.

Family 1. *Erecta.* Hands only with opposable thumbs. Erect walk on the entire sole of the foot.....Genus 1.

II. Pollicata.

2. *Quadrumana.* Opposable great toes on all the feet. 4 incisives in each jaw, close together.....Genera 2–13.

3. *Prosimii.* All the feet with opposable great toes, the second toe of the hind foot with a crooked sharp pointed nail. 4 incisives above, two and two; 6 below.....Gen. 14–16.

4. *Macrotarsi.* Opposable great toes on all the feet, second toe of the hind foot with a crooked nail. Metatarsi longer than the tibia. 4 incisives above, close together or separated; 2 or 6 below.....Gen. 17–18.

5. *Leptodactyla.* The hind foot with an opposable great toe. The two middle toes of the fore feet elongated, slender. 2 incisives in each jaw. A space between the incisives and canines.....Gen. 19.

6. *Marsupialia.* The hind foot with an opposable great toe. An abdominal pouch. Teeth various.....Gen. 20–27.

III. Salientia.

7. *Salientia.* Feet for springing, without great toes; two toes of the hind feet joined together. Abdominal pouch. 6 or 8 incisives above, 2 below. Canines doubtful, or none.....Gen. 28–29.

IV. Prensiculantia.

8. *Macropoda.* Feet for springing. Grinders simple or complicated, 8 or 6 above and below.....Gen. 30–32.

9. *Agilia.* Fore feet with 4 toes, and a tubercle in place of the great toe. 8 or 10 grinders above, 8 below, simple. Tail long, hairy, and generally with the hairs pendent on each side like a feather..Gen. 33–36.

10. *Murina.* Fore feet with 4 or 5 toes, and a tubercle in place of the great toe. Grinders simple, 10, 8 or 6 above; 8 or 6 below. Tail either elongated and hairy, or naked and ringed, or short.....Gen. 37–41.

11. *Cunicularia.* Feet with five toes, separate. Grinders laminar or complicated, 6 in each jaw. Body hairy. Tail hairy.....Gen. 42–44.

12. *Palmipeda.* Hind feet palmated, and with five toes. Grinders complicated, 4 or 10 above, 4 or 8 below.....Gen. 45–46.

13. *Aculeata.* Grinders complicated, 10 to each jaw. Body with prickles.....Gen. 47–48.

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14. *Duplicidentata.* Grinders laminar, 12 above, 10 below, upper incisives double.....Gen. 49-50.

15. *Sub-ungulata.* Grinders laminar or complicated, 8 in each jaw. Body hairy. Nails approaching hoofs, or hooked; 3 toes to the hind feet. Gen. 51-54.

V. Multungula.

16. *Lamnunguia.* Short muzzle without hairs. Feet with flat nails. 2 incisives above, 4 below. Many grinders, complicated...Gen. 55-56.

17. *Proboscidea.* Feet with flat nails. A proboscis. 2 incisives above, ascending, passing out of the mouth, none below. Grinders laminar, 4 in each jaw at most.....Genus 57.

18. *Nasicornia.* 3 nails, touching the ground when walking. 1 or 2 nasal horns.....Genus 58.

19. *Obesa.* 4 nails, touching the ground when walking. 4 incisives above, 4 below, projecting. Canines inclosed within the mouth. Gen. 59.

20. *Nasuta.* 4 nails on the fore feet, 3 behind, touching the ground when walking. Proboscis. 6 incisives to each jaw. Canines a little longer than the incisives, and enclosed within the mouth when shut. Gen. 60.

21. *Setigera.* 2 nails, touching the ground when walking, and 1 or 2 not. Proboscis truncated, broad at the extremity. Canines visible when the mouth is shut.....Gen. 61.

VI. Solidungula.

22. *Solidungula.* Feet with 1 toe and 1 entire hoof.....Gen. 62.

VII. Bisulca.

23. *Tylopoda.* Feet with 2 toes, almost joined together, the extremities, only, separated, and bearing the hoofs. 2 incisives above, 6 or 8 below. Upper canines.....Gen. 63-64.

24. *Devexa.* Horns solid, frontal, straight, perennial, covered with skin, terminated by a bundle of hairs. No nails which do not touch the ground.....Gen. 65.

25. *Capreoli.* Either deciduous horns, or, when they are wanting, either projecting canines or nails not touching the ground. Gen. 66-67.

26. *Cavicornia.* Hollow horns, ensheathing, and fixed on the bony processes. No canines.....Gen. 68-70.

VIII. Tardigrada.

27. *Tardigrada.* Feet with crooked nails. No incisives. Canines. Grinders simple.....Gen. 71-73.

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IX. Effodientia.

28. *Cingulata.* Body defended by a horny coat intersected by bands. Gen. 74-75.

29. *Vermilinguia.* Teeth either entirely wanting, or fibrous grinders only. Tongue extensible, for catching worms and ants. Gen. 76-78.

X. Reptantia.

30. *Reptantia.* Feet with crooked nails. No real teeth. No mammæ. Cloaca.....Gen. 79-80. *b.*

XI. Volitantia.

31. *Dermoptera.* Fore and hind feet connected by a membrane formed by a dilatation of the skin of the sides of the body, but the paws free.....Gen. 81.

32. *Chiroptera.* The elongated slender fingers of the fore paws traversing the connecting membrane like radii, the hind paws free. Gen. 82-90.

XII. Falculata.

33. *Subterranea.* The whole of the sole of the foot set to the ground in walking. Incisives various. Canines doubtful. Grinders presenting several sharp points on the crowns.....Gen. 91-98.

34. *Plantigrada.* The whole of the sole of the foot set to the ground in walking. 6 incisives in each jaw. Canines longer, solitary, separated. Grinders tuberculous, or edged; the back grinders with broader crowns, larger, and tuberculous.....Gen. 99-104.

35. *Sanguinaria.* Only the fore part of the sole, or the toes of the foot, set to the ground in walking. Six incisives above, 6 below, placed in the same line. Canines solitary, distinct, longer than the incisives. Grinders edged, the last smaller, with broader crowns, tuberculous. Gen. 105-110.

66. *Gracilia.* Only the ends or toes of the feet set to the ground in walking, and sometimes palmated; the basilary joints shortened, and within the trunk of the body. Six incisives above, 6 or 4 below. Canines, solitary, distinct, elongated. Grinders edged, the last with broader crowns and tuberculous.....Gen. 111-114.

XIII. Pinnepidia.

37. *Pinnepidia.* Feet with the basilary joints within the body; those behind pinniform, distinct, turned backwards.....Gen. 115-116.

XIV. Natantia.

38. *Sirenia.* The fore limbs exterior, terminated by crooked nails or an obtuse enveloping nail; the bones of the hind limbs within the tail.....Gen. 117, 118, 119.

39. *Cete.* Pectoral fins inserted in the trunk, no hind limbs. Tail prolonged into a fin. Spiracula.....Gen. 120-125.

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GENERA.	SPECIES.
1. *Homo*	Homo sapiens, L.
2. *Simia. Cuv.* Orang . . .	Simia Troglodytes.] Satyrus, L.
3. *Hylobates* (υλοβατης, per sylvas gradiens), *Gibbon, C.*	Simia Lar, L.
4. *Lasiopyga* (λασιος, villosus; πυγη, anus)	Simia Nemæa, L. Simia Nictitans, L.
5. *Cercopithecus, C.* Guenon. Monkey .	Simia Nasica. Simia Cynamolgos. Sabæa, L.
6. *Cynocephalus, C.* Papio, *C.* Ape. Baboon.	Simia Silenus, L. Simia Sphinx, Mormon, L. Pongo Wurmbii, L. Simia Inuus, L. Simia Polycomos.
7. *Colobus* (κολοβος, mutilatus) . .	Simia Ferruginea.
8. *Ateles*	Simia Paniscus, L.
9. *Mycetes* (μυκητης, mugiens), Cebus, *C.* Alouate	Simia Belzebub, L. Simia Seniculus, L.
10. *Pithecia*	Simia Pithecia, L. Simia Satanas.
11. *Aotus*	Simia Trivirgata.
12. *Callithrix, C.* Sapajou . . .	Simia Capucina, L. Simia Sciurea, L.
13. *Hapale* (ἁπαλος, mollis), Saguinus, *C.* Sagouin	Simia Rosalia, L. Simia Midas, L. Simia Iacchus, L.
14. *Lichanotus* (λιχανος, digitus, index). Indri	Lemur Indri, L. Laniger.
15. *Lemur.* Maki. Maucaco. Lemur . .	Lemur Mongoz, L. Lemur Catta, L.
16. *Stenops* (στενος, angustus, ωψ, oculus, vultus). Lori	Lemur Tardigradus, L.
17. *Tarsius.* Tarsier	Didelphys Macrotarsus, L.
18. *Otolicnus* (ωτολικνος, auriculis magnis). Galago	Lemur Galago.

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GENERA.	SPECIES
19. *Chiromys*, Aye Aye . . .	Scuirus Madagascariensis, L.
20. *Didelphys*, *C.* Sarigue. Opossum. .	Didelphys Marsupialis, L. Didelphys Murina, L.
21. *Chironectes* (χειρ, manus; νηκτης, natator)	Lutra Minima.
22. *Thylacis* (θυλαξ, saccus, marsupium). Perameles	Didelphys Obesula. Perameles Nasuta.
23. *Dasyurus*	Didelphys Viverrina.
24. *Amblotis* (αμβλωσις, abortus), Wombat	Wombatus Fossor.
25. *Balantia* (βαλαντιον, marsupium), Phalangista, *C.*	Didelphys Orientalis, L. Didelphys Lemurina.
26. *Phalangista*	Didelphys Petaurus. Didelphys Sciurea.
27. *Phascolomys*	Phascolomys Fusca.
28. *Hypsiprymnus* (υψιπρυμνος, parte postica elevata). Potoroo . . .	Didelphys Potoru.
29. *Halmaturus* (αλμα, saltus; ουρη, cauda). Kanguroo	Didelphys Gigantea, L. Didelphys Brunii, L.
30. *Dipus*. Gerboise, Yerboa . . .	Dipus Sagitta, L. Dipus Jaculus, L. Dipus Canadensis.
31. *Pedetes* (πηδητης, saltator) . .	Dipus Cafer, L.
32. *Meriones* (μηρος, femur). Gerbille .	Dipus Tamaricinus, L. Dipus Meridianus, L.
33. *Myoxus*. Loir. Dormouse . .	Myoxus Glis, L. Myoxus Avellanarius.
34. *Tamias* (ταμιας, promus, condus). .	Sciurus Striatus, L.
35. *Sciurus*. Guerlinguet. Squirrel . .	Sciurus Vulgaris, L. Sciurus Æstuans, L. Sciurus Palmarum, L.
36. *Pteromys*. Polatouche. Flying Squirrel	Sciurus Volans, L. Sciurus Petaurista, L.
37. *Arctomys*. Marmot . . .	Arctomys Marmota, L. Arctomys Monax, L. Arctomys Citillus, L.

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38. *Cricetus.* Hamster	Mus Cricetus, L. Mus Phæus, L. Mus Bursarius.
39. *Mus.* Rat. Mouse	Mus Decumanus, L. Mus Rattus, L. Mus Musculus, L. Mus Vagus, L.
40. *Spalax, C.* Zemmi . . .	Mus Typhlus, L.
41. *Bathyergus* (βαθυεργειν, terram profunde laborare)	Mus Maritimus, L.
42. *Georychus* (γεωρυχος, qui terram fodit). Rat Taupe. Mole Rat . . .	Mus Capensis, L. Mus Talpinus, L. Mus Aspalax, L.
43. *Hypudæus* (υπυδαιος, subterraneus). Lemmus. Link, *C.* Campagnol .	Mus Lemmus, L. Mus Amphibius, L. Mus Arvalis, L.
44. *Fiber, C.* Ondatra. Muskbeaver* .	Mus Zibethicus.
45. *Hydromys*	Mus Coypus, L.
46. *Castor, C.* Beaver	Castor Fiber, L.
47. *Hystrix.* Porcupine . . .	Hystrix Castrata, L. Hystrix Dorsata, L. Hystrix Prehensilis, L.

* Iliger thus divides the Genus Mus, as it was formerly called, into two Families composed of eight Genera. But the characteristics of these two Families are so ambiguous, and the animals evidently related are so far removed from each other, that, in this respect, the classification is objectionable, both in a natural and artificial point of view.

M. Kuhl, therefore, has submitted another arrangement, founded principally on the presence or absence of exterior ears or auricles, and of the fifth toe of the fore feet.

I. Auricles: 4 toes on the fore feet.

Gen. 1. Arctomys, tail short, shaggy.
— 2. Cricetus, tail moderate or short, little hairy, cheek pouches.
— 3. Mus, tail long, round, little hairy, auricles long and naked.
— 4. Fiber, tail compressed, auricles moderate and hidden.
— 5. Hypudaeus, tail short, round, hairy, hairs of the body very short.

II. No Auricles: 5 toes on the fore feet.

Gen. 6. Georychus, tail hairy, roundish, very short.
— 7. Bathyergus, tail hairy, somewhat compressed, short.
— 8. Spalax, no eyes, no tail.

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GENERA.	SPECIES.
48. *Loncheres* (λογχηρης, qui lanceam fert). Echimys, *C.*	Loncheres Paleacea. Hystrix Chrysuros, L.
49. *Lepus.* Lapin. Lievre. Hare. Rabbit .	Lepus Timidus, L. Lepus Cuniculus, L. Lepus Tapeti, L.
50. *Lagomys.* Pica	Lepus Pusillus, L. Lepus Alpinus, L. Lepus Ogotona, L.
51. *Cœlogenys*	Cavia Paca.
52. *Dasyprocta* (δασυς, hirsutus; πρωκτος, anus). Agouti, *C.* . . .	Cavia Aguti, L. Cavia Acuchi, L.
53. *Cavia, C.* Cochon d'Inde. Cavy .	Cavia Aperea, L.
54. *Hydrochœrus, C.* Cavia, *L.* Cabiai. Capybara	Cavia Capybara, L.
55. *Lipura* (λειπουρος, cui cauda deest) .	Hyrax Hudsonius.
56. *Hyrax, C.* Daman	Hyrax Capensis, L. Hyrax Syriacus, L.
57. *Elephas, C.* Elephant . . .	Elephas Indicus. Elephas Africanus.
58. *Rhinoceros*	Rhinoceros Bicornis. Rhinoceros Unicornis.
59. *Hippopotamus*	Hippopotamus Amphibius, L.
60. *Tapirus.* Tapir	Tapirus Americanus.
61. *Sus.* Hog	Sus Babyrussa, L. Sus Scrofa, L. Sus Æthiopicus, L. Sus Tajassu, L.
62. *Equus.* Cheval. Ane. Horse. Ass .	Equus Caballus, L. Equus Asinus, L.
63. *Camelus.* Chameau. Camel .	Camelus Dromedarius, L. Camelus Bactrianus, L.
64. *Auchenia* (αυχην, collum). Llacma, *C.* Llama	Camelus Llacma, L. Camelus Vicunna, L.
65. *Camelopardalis.* Giraffe . . .	Camelopardalis Giraffa, L.

GENERA.	SPECIES.
66. *Cervus*. Cerf. Deer	Cervus Alces, L. Cervus Tarandus, L. Cervus Elaphus, L. Cervus Capreolus, L. Cervus Mexicanus, L.
67. *Moschus*. Chevrotain. Musk . .	Moschus Moschiferus, L. Moschus Indicus, L.
68. *Antilope*	Antilope Gnu, L. Antilope Oreas, L. Antilope Gazella, L. Antilope Bubalis, L. Antilope Grimmia, L. Antilope Strepsiceros, L. Antilope Rupicapra, L.
69. *Capra*. Ovis. Chevre. Brebis. Goat. Sheep.	Capra Ibex, L. Capra Agagrus, L. Ovis Ammon, L. Ovis Aries, L.
70. *Bos*. Bœuf. Ox	Bos Urus, L. Bos Moschatus, L. Bos Grunniens, L. Bos Bubalus, L.
71. *Bradypus*. Paresseux. Sloth . .	Bradypus Tridactylus, L.
72. *Choloepus* (χωλοιπους, pede claudus) .	Bradypus Tridactylus, L. Bradypus Torquatus.
73. *Prochilus* (προχειλος, labrosus) .	Bradypus Ursinus.
74. *Tolypeutes* (τολυπευειν, conglomerare)	Dasypus Tricinctus, L. Dasypus Quadricinctus, L.
75. *Dasypus*. Tatou. Armadillo . .	Dasypus Sexcinctus, L. Dasypus Unicinctus, L. Dasypus Octocinctus, L. Dasypus Novemcinctus, L.
76. *Orycteropus*	Myrmecophaga Capensis, L.
77. *Myrmecophaga*. Fourmilier. Ant-Eater	Myrmecophaga Jubata, L. Myrmecophaga Tetradyctyla, L. Myrmecophaga Didactyla, L.

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GENERA.	SPECIES.
78. *Manis.* Pangolin	Manis Tetradactyla, L. Manis Pentadactyla, L.
79. *Tachyglossus* (ταχυς, velox; γλωσσα, lingua). Echidna, *C.* . . .	Myrmecophaga Aculeata, Shaw, Echidna Setosa, Cuv.
80. *Ornithorhyncus.* Platypus . .	Ornithorhyncus Fuscus et Ornithorhyncus Rufus.
80 *Pamphractus* (πας, totus; φρακτος, tectus, loricatus)	Testudo Squamata *Bontii*, L.
81. *Galeopithecus.* Colugo . . .	Lemur Volans, L.
82. *Pteropus.* Ternate-Bat . . .	Vespertilio Vampyrus, L.
83. *Harpyia* (avis fœda vultu humano Mythologiæ)	Vespertilio Cephalotes, L.
84. *Vespertilio.* Chauve-Souris. Bat . .	Vespertilio Murinus, L. Vespertilio Auritus, L. Vespertilio Lasiopterus, L.
85. *Nycteris*	Vespertilio Hispidus, L.
86. *Rhinolophus*	Vespertilio Ferrum Equum, L.
87. *Phyllostomus*	Vespertilio Spasma, L. Vespertilio Spectrum, L. Vespertilio Perspicillatus, L.
88. *Noctilio*	Vespertilio Leporinus, L.
89. *Saccopteryx* (σακκος, saccus; πτερυξ, ala)	Vespertilio Lepturus, L.
90. *Dysopes* (δυσωπεω, horribili specie pecterreo). Molosse	Vespertilio Molossus, L.
91. *Erinaceus.* Herisson. Hedge-Hog .	Erinaceus Europæus, L.
92. *Centetes* (κεντεω, pungo) Letifer, *C.* Tenrec	Erinaceus Ecaudatus, L.
93. *Sorex.* Musaraigne. Shrew . .	Sorex Araneus, L. Sorex Exilis, L. Sorex Minutus, L.

GENERA.	SPECIES.
94. *Mygale, C.* Desman	Sorex Moschatus, L.
95. *Condylura* (κονδυλος, nodus; ουρη, cauda)	Sorex Cristatus, L. Talpa Longicaudata, L.
96. *Chrysochloris, C.*	Sorex Auratus, L.
97. *Scalops, C.*	Sorex Aquaticus, L.
98. *Talpa.* Taupe. Mole	Talpa Europæus, L.
99. *Cercoleptes* (κερκος, cauda; ληπτης, capiens). Potos, *C.* Kinkajou	Viverra Caudivolvula, L.
100. *Nasua, C.* Couati	Viverra Narica, L. Viverra Nasua, L.
101. *Procyon, C.* Raton. Raccoon	Ursus Lotor, L.
102. *Gulo, C.* Glouton. Grison. Glutton	Ursus Gulo, L. Viverra Mellivora, L. Mustela Barbara, L.
103. *Meles.* Taxus, *C.* Blaireau. Badger	Ursus Meles, L. Ursus Labradorius, L.
104. *Ursus.* Ours. Bear	Ursus Arctos, L. Ursus Maritimus, L. Ursus Americanus, L.
105. *Megalotis* (μεγας, magnus; ους, auris). Fennec	Canis Cerda, L.
106. *Canis.* Chien, etc. Dog. Wolf. Fox	Canis Lupus, L. Canis Aureus, L. Canis Vulpes, L.
107. *Hyæna*	Canis Hyæna, L. Canis Crocuta, L.
108. *Felis, C.* Cat. Lion. Tiger. Lynx	Felis Leo, L. Felis Tigris, L. Felis Pardalis, L. Felis Lynx, L. Felis Catus, L.
109. *Viverra, C.* Civet	Viverra Zibetha, L. Viverra Civetta, L. Viverra Genetta, L.
110. *Ryzæna* (ρυζειν, hirrire ut canis)	Viverra Tetradactyla, L. Viverra Zenik, L.
111. *Herpestes* (ερπηστης, reptans) Mangouste. Ichneumon	Viverra Ichneumon, L. Viverra Mungo, L. Viverra Cafra, L.

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GENERA.	SPECIES.
112. *Mephitis, C.*	Viverra Putorius, L.
113. *Mustela.* Belette, etc. Weasel. Martin. Polecat	Mustela Martes, E. Mustela Putorius, L. Mustela Vulgaris, L.
114. *Lutra.* Otter	Lutra Vulgaris, L. Lutra Marina, L. Lutra Lutreola, L.
115. *Phoca.* Seal	Phoca Subata, L. Phoca Ursina, L. Phoca Vitulina, L. Phoca Pusilla.
116. *Trichechus.* Morse. Wallruss . .	Trichechus Rosmarus, L.
117. *Manatus.* Lamantin. Manati . .	Trichechus Manatus Australis.
118. *Halicore* (αλιος, marinus; κορη, puella). Dugong	Trichechus Dugong, L.
119. *Rytina* (ρυτις, ruga) . . .	Trichechus Manatus Borealis, L.
120. *Balæna.* Mysticite. Whale . .	Balæna Mysticetus, L. Balæna Physalus, L.
121. *Ceratodon.* Monodon. Narwhal .	Monodon Monoceros, L.
122. *Ancylodon* (αγκυλος, incurvus; οδους, dens). Anarnak	Monodon Spurius.
123. *Physeter.* Cachalot . . .	Physeter Macrocephalus, L. Physeter Cylindricus, L. Physeter Microps, L.
124. *Delphinus.* Dolphin . . .	Delphinus Albicans, L. Delphinus Delphis, L. Delphinus Phocæna, L. Delphinus Orca, L.
125. *Uranodon* (ουρανη, palatum; οδους, dens).	Delphinus Butzkopf, L.

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Remarks on the characters and affinities of the Orders.

POLLICATA.

The Pollicata all inhabit the warm regions, and principally the woods. The Genera which compose this order have, for the most part, their peculiar countries; those of the Marsupialia, with a pendent and hairy tail, inhabit Australasia; those with a prehensile tail and distinct toes, as the Genus Didelphis, are only found in America; the Genera Lemur and Tarsius are not known in the New World. The gradation from the Pollicata to the Salientia, and their natural connection, is evident in the Perameles, Dasyurus, and Amblotis, which have tubercles only, instead of thumbs, on their hind-feet. Nature also connects these two orders very closely by the Marsupialia, for both the Marsupialia and the Salientia have pouches; some of the hind-toes of both are generally united, and all their organization accords in a very remarkable degree.

The Families Prosimii and Macrotarsi approximate to the Genus Dipus of the Prensiculantia by their elongated hind-legs. The Genus Phascolomys offers the same teeth as the Prensiculantia, and both live on vegetables; which induced Dumeril to transfer that Genus from the Pollicata to the Salientia. Three Genera of the Marsupialia, by their long prehensile tail, and two, by their long naked ears, approach the Genus Mus of the Prensiculantia. The Genus Phalangista, by the membranous wings attached to its feet, approaches the Pteromys Petaurista of the same Order, as well as the Family Dermopetra of the Volantia.

SALIENTIA.

This Order is so closely connected with the Pollicata by the form of the genitals, and by the digestive and other organs, that, in a purely natural system, they could not be separated; in an artificial system, however, they must be, with the distinctive character of wanting great toes on the hind-feet. The Salientia are connected with the Prensiculantia by the Jerboa, and by the circumstance of the greater number of the former, and all of the latter, having a void interval in the place of the canines.

But there are still more affinities between this Order and the Ruminantia; although so unlike in external form, especially in their organs of mastication and digestion, which is not extraordinary, their food being the same. The articulation and motion of the

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lower jaw is the same; they agree in the great size of their salivary glands and the length of the intestines; the stomach of the Salentia is also divided into two parts, and has numerous cæca.

PRENSICULANTIA.

This Order comprehends such various animals, that its numerous affinities with others are not to be wondered at. Some of its Genera live on the surface of the earth (Lepus); some within it (Spalax, Bathyergus, Georychus); some in the trees (Scuirus); some under water (Castor); some in the air (Pteromys); some are covered with hair, and some with prickles, and we shall presently observe the same varieties in their organization. The organs of smell and hearing are very much developed in all; the strength of the other senses varies; but their apparatus for digesting and masticating is always similar. Some have a simple stomach, some a double (Mures), others a triple one (Hystrices). Their salivary glands and liver, to which a gall bladder is generally added, are very large. The Genera Pedetes and Dipus connect this Order with the Macrotarsi and Salentia; the Mures with the Didelphis of the Marsupialia; the Spalax with the Talpa of the Falculata; the Palmipeda with the Chironectes of the Pollicata and the Lutra of the Falculata; the Aculeata with the Erinacea of the Falculata; the Sub-Ungulata with the Multungula.

MULTUNGULA.

The feet of these animals appear to be of a singular structure, but we cannot help admiring their aptness to the rest of the frame and to their manner of life, for all these animals are herbivorous, and neither require nails to dig up the earth or to seize their prey. They have an immense length of intestine, and their stomachs are divided into four or five parts, thus approximating them to the Prensiculantia, of which order the stomach of the Mus Rattus is double, and that of the Hystrix triple. Some have hoofs with one cleft, some with several, others with none: Aristotle first divided them, and modern authors have named them Solidungula, Bisulca, and Multungula, according to the number of these clefts. The latter are characterized by a thick insensible skin, small eyes, deficiency of brain, and the perfection of their organs of hearing and smell, for which reason most of them have a trunk. They are destitute of clavicles, like the Solidungula and Ruminantia; their liver is but little divided, consistently with the opinion of

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Tiedemann, that this organ is always more so in proportion as the animal possesses more irritability and activity.

Although there may appear to be a wide interval between the Prensiculantia, generally of so small and symmetrical a form, and the Multungula, of such an enormous figure that Blumenbach has called them *Spreckthieren*, or terrific animals, yet these Orders are very naturally connected by the Family of Lammunguia, which approximate very closely to the Subungulata in the form of their nails and their want of a tail. It is impossible, however, to shew a transition in the external forms of the animals of this Order. The Rhinoceros and Hippopotamus have no proboscis, but their chiloma (the lower part of the nose and upper lip taken together) is very broad, and this region is so much elongated in the Genus Sus that Iliger calls it a truncated proboscis. The proboscis of the Tapir seems to be intermediate between that of the Sus and the Elephant. The hardness of the skin is progressive through the Sus, Elephas, and Rhinoceros. The extraordinary tusks of the Genus Sus increase in size from the S. Tajassu and S. Africanus, to the S. Scrofa and S. Ethiopicus, until they reach the singular form of the Sus Babyrussa; their structure has some analogy with that of the tusks of the Elephant, like which the animal uses them against its enemies, but employs them, besides, in digging the earth.

BISULCA.

The hoof of the camel is intermediate between that of the Multungula (to which its bulky figure refers it) and that of the Bisulca. Like the former they are affixed to the end of the first joint, but they present a callous skin beneath. The following Genus (Auchenia, Llama) has a similar structure of foot, but with larger nails; and, by their more graceful figure, approach the Genus Cervus. The Cameleopard seems to join the Bisulca with the Solidungula, for in its size, form, head, mane, and tail it resembles the latter; and its horns covered with short hairs (only found besides on those of the Cervus Tarandus), and intermediate between those of the Capreola and Cavicornia, refer it to the latter. The horns of the Genus Capra are angular, transversely streaked or knotted; those of the Genus Bos semi-circular, plain, and smooth; of the Antelope generally more or less smooth; but the Antelope Strepsiceros has angular horns, and thus forms the transition to the Genus Capra. No Antelope has semi-circular horns directed sideways; but the A. Gnu so closely resembles the Genus Bos that we might imagine it to belong to it.

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FALCULATA.

The senses of hearing and smell are exceedingly acute in the animals of this Order, especially in the Genus Felis. Their brain is small, their muscles strong and very red, and their heart and lungs very large. Their organs of generation, contrary to those of the Ruminantia, are small, and the more so as the animal is more rapacious. All their digestive organs are so concentrated as quickly and effectually to convert the food into chyle.

TARDIGRADA AND EFFODIENTIA.

These animals are of an inferior organization, and their senses, except that of smell, but little developed. The Tardigrada with a cloaca resemble the Simiæ in some degree by the greater length of their fore feet, their countenance, and by their living in trees. Their quadruple stomach, large rectum, and salivary glands, connect them with the Ruminantia; but they have much less length of intestine.

VOLITANTIA.

These animals seem to connect the Mammalia with the Birds.

REPTANTIA.

The Order appears to be intermediate between the Amphibia, Birds, and Mammalia; the structure of the head, and, in the Ornithorhynchus, of the beak also, resembles that of Birds. In their genitals and cloaca, they agree with the Amphibia, and the Ornithorhynchus lives in the two elements; but in the hair and all other parts they agree with the Mammalia.

PINNIPEDIA AND NATANTIA.

They appear to form the gradation between the Mammalia and the Fishes. The form of the head and the teeth of the Seal approach it to the Order Falculata; the ears of the P. Jubata and P. Ursina resemble those of the Feræ. The Cetacea approach very closely to the Fishes, by their extraordinary Spiracula, by which they expel the water received by the mouth, as the latter do with their branchiæ.

Remarks on the connections and gradations of the Families.

PROSIMII.

The Genus Lichanotis is a natural link between the Prosimii and the Quadrumana; the sharp muzzle and the crooked nails of its great toes conect it with the former, its four incisives in each jaw with the latter. The Quadrumana of the Old World differ in form and organization from those of the New. Those of America, with scarcely a single exception, have the nostrils separated by a broad partition (septo lato); those of Asia and Africa by a narrow one: the former have neither tylia nor callosities, nor cheek pouches, which we find in the greater part of those of Asia and Africa, and they have always a tail, which is frequently wanting in the latter. The long tarsi of the Lemur Cinereus and the Stenops Gracilis, in those of the last two Genera of the Prosimii, prepare us for the Macrotarsi, still more disproportionate.

MARSUPIALIA.

The pouch does not exist in all the Marsupialia, although the supernumerary bones of the pelvis are always found; it is most perfect in the Didelphis Opossum and the D. Philandrus; in the D. Marsupialis it is evidently imperfect, and in the D. Caryopollis, Murina, Dorsigera and Brachyurus, it is wholly wanting. This Family may be divided into two sections: those with long, prehensile, scaly tails; and those with short, straight, hairy tails: the elongated tail of the Dasyrus, which belongs to the latter, connects these two divisions. The gradual transition in the separation of the toes is not less obvious: in the Dasyurus and Amblotis they are entirely divided; and necessarily, since the former is a rapacious animal and therefore requires a rapid course, whilst the latter is compelled to dig the earth, to both of which qualities connected toes would be a great impediment. In the Genus Thylacis the second toe is joined with the third; it is the same in the Phascolomys, wherein the third is also joined to the fourth. The Phascolomys connects the Marsupialia, by a very gentle transition, with the Prensiculantia, through the Pteromys; and with the Volitantia, through the Galeopithecus. The Genus Thylacis has considerable affinity to the Genus Meles of the Falculata. The crooked nails and the teeth of the Dasyurus resemble those of the Feræ; the thumb of the hind foot is almost wanting; and, according to Peron, who saw two Dasyuri Macrouri devouring a large

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Seal, their manner of life is the same; the form of their head is like that of a Fox. The Genus Amblotis resembles the Plantigrada in figure, and approaches them, especially the Genus Ursus, by its short thick head, short feet, and elongated nails. The Genus Phascolomys, although herbivorous, has the small cæcum and vermiform intestine of the Genera Homo and Simia, and practises the same erect and supine motions with its body.

MACROPODA.

The Meriones connect this Family so naturally with those of Cunicularis and Murina, that it is doubtful to which of the three this Genus properly belongs. Pennant and Pallas placed its species amongst the Mures; more recent authors have removed it to the Macropoda. The Genus Tamia, which has not only the same manner of life as the Mures, but also the same cheek pouches, connects the Family of Agilia with that of Murina.

MURINA.

The Murina are so intimately linked with the Cunicularia that it is difficult to seize the distinctions between these two Families, which ought perhaps to form but one. The transition from the Cunicularia to the Palmipeda is evident, for Linnæus comprehended the Fiber of the latter in the same Genus: the Fiber, however, certainly wants the distinguishing character of the Palmipeda: the Mus Caracus, having its hind feet palmated, is intermediate between these two Families. The Genus Loncheres agrees so much with the Mus Rattus and Decumanus, especially from the approach of its long stiff hairs to weak prickles, that it forms a gradation between the Aculeata and the Murina.

PALMIPEDA.

Nature indicates the passage from the Cunicularia to this Family by the resemblance of the form of the Fiber Zibethicus to that of the Castor, whilst it wants the palmated feet. The smooth hairy pointed tail of the Hydromys connects it with the Murinæ, whilst its feet place it with the Castor: this lately discovered Genus, therefore, has filled up the interval by which the Castor was thitherto separated from all other Mammalia.

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ACULEATA.

This Family inhabits warm regions. Although the Hystrix Cristata appears to differ from all animals by the length and thickness of its spines, yet the other species form a transition between it and those of the more common form. The H. Dorsata has much smaller prickles, and those only on the back; in the H. Prehensilis they are small and intermixed with hairs; in the H. Chrysurus they are generally wanting, so that there is very little difference between this animal and the Genus Dasyprocta. The Genus Hystrix, in its covering, approaches that of Sus in the Family of Erinaceus. The H. Prehensilis, it should be observed, is so decisively distinguished by its prehensile tail, that Dumeril has separated it from the others, and formed a distinct Genus under the name of Condus. Iliger has separated the species Chrysurus and Paleacea, and formed the Genus Loncheries, which, as they have hairs instead of prickles, and a long tail, approach the Genus Mus.

DUPLICIDENTATA.

There is no Genus yet discovered which has shewn the transition between the teeth of any other Family and those of the Duplicidentata. In the form of their hind legs they somewhat resemble the Macropoda, but they differ again esentially in having either a very short tail or none at all; in fact, this Family offers fewer affinities than any other, nor are its Genera very closely connected. That of Lepus presents a short tail, the Lagomys none; the former has long pointed ears, those of the latter are small and rounded. The Lagomys approaches nearest to the Cavia of the Family Sub-Ungulata. The Cœlogenys Paca differs but little from the Lagomys in its form and appearance, but it has cheek pouches. The Hydrochœrus Capybara also approaches it very nearly in form; but is distinguished by its size and its palmated hind feet.

SUB-UNGULATA.

This Family is closely approximated to that of Falculata, by the Genera Dasyprocta and Cavia.

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TARDIGRADA.

The Bradypus Tridactylus, and the Cholœpus Didactylus, are distinguished by excessively long nails on all their feet; but the Prochilus Ursinus presents the transition to the ordinary size, since the nails of its fore feet are less than those of the preceding Genera, and those of its hind feet are very small; it is also intermediate from having five toes to each foot. The former Genera have short muzzles, like those of Apes; but that of the Prochilus is elongated, with cartilaginous lips, making it the link between the Tardigrada and the Effodientia. The Tardigrada have no incisive teeth, the Effodientia no incisives or canines; some of them indeed have no teeth at all, so that they form a natural gradation from the Effodientia to the Reptantia.

VOLITANTIA.

The Genera Pteromys and Phalangista of the preceding Orders are able to sustain themselves a short time in the air, by the extension of the skin of the flanks. The Genus Dermoptera of the present Family, although they may be said to fly, and their tail and legs are involved in the membrane, have their paws free. In the Chiroptera the hands or paws are within the wings: thus there is an evident transition.

SUBTERRANEA.

Iliger has formed this Family of those Plantigrada whose canines differ very little from the other teeth. It comprehends small animals, not very different from the Prensiculantia, such as the Genus Erinaceus, Sorex, and Talpa, yet differing so much between themselves that we are unable to trace a transition. The Scalops Aquaticus has some properties common with the Talpa and Sorex; its small eyes, want of ears, and short tail, approximate it to the former, and the size of its fore feet to the latter.

PLANTIGRADA.

The Subterranea, as we have just observed, are, properly speaking, Plantigrada; but Iliger confines this name to those Falculata which have the canine teeth much larger and stronger than the others. The transitions of the different Genera are more

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conspicuous in this Family than in the preceding, all the animals of which are small, whereas those of the present are large, or at least of a moderate size. Linnæus referred them all to the Genera Viverra and Ursus; recent Zoologists have made six Genera of them. The Genus Cercoleptes differs from the others, by its voluble tail, but the length of this member agrees with that of the Genus Nasua, and their short muzzle approaches them to the Genus Ursus. The animals of the Genera Nasua and Procyon are rarely distinguishable from each other at first sight; but the muzzle and tail of the latter are shorter in proportion, and the exterior incisive tooth of the upper jaw is distant from the others. The tail of the Genus Gulo is shorter than that of the Procyon, and it is still shorter in the Meles; the nails of their hind feet are much longer than those before: the body of these animals is hairy, that of the Ursus woolly. The form of their skull, their motions, their organs of digestion, manner of life, torpidity during winter, and abstinence from food, closely connect all these animals. All the Plantigrada want the cæcum, and have long intestines; the Digitigrada (Sanguinaria and Gracilia) have much shorter intestines, and also a short cæcum; in this respect, the Martes and Lutra of the Gracilia agree with the Plantigrada.

SANGUINARIA.

The Sanguinaria, or animals with the incisive teeth placed parallel to each other, have four or six toes on each foot, or sometimes five on the fore feet and four on the hind feet. The Megalotis differs from all the others by having ears much larger than the head; otherwise, and especially in the sharp muzzle, it resembles the Genus Canis, in which it was formerly placed. The Canis is a very natural Genus from the number of the teeth, the fixed nails, and the acute form of the skull. The Genus Hyæna, the nearest to that of Canis, differs from it by its four toes on each foot, its dorsal mane, and ferocious manners; it is intermediate between that Genus and the Felis, closely resembling the latter in its tongue, teeth, and cruelty: the Felis Jubata also has a dorsal mane. The Felis differs from the Canis by the ensheathed nails and rounded head; in the true Feles the tail touches the ground; in the Lynx it only reaches the tarsus; in the Cerval it is longer, but does not touch the ground. The F. Pardalis and Unca are intermediate between the striped and spotted Feles; the F. Lynx and Caracal between those with and without spots. The Genus Viverra unites the properties of the Canes, Feles, and Mustelæ;

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they have the sharp muzzle of the first; their nails are semi-retractile; and they have the form of the latter: they have the keen sight and smell of the Feles, and their eyes also glare by night when they seek their food. The Genus Lutra, from its palmated toes, at first seems distinct from the others, but it is a transition; for those who have had the opportunity of examining several of the species Viso, have found the membrane so small that they have sometimes classed it with the Mustela, and sometimes with the Lutra. The Genus Lutra is the natural transition from the Falculata to the Pinnipedia.

GRACILIA.

They form a transition between the Plantigrada and Digitigrada, for they have the shorter feet of the former and the walk of the latter. The Genus Mephitis, by its anatomy and elongated fore nails for digging, forms a transition to those of Meles and Gulo. The Genus Herpestes is distinguished from the others by the elongated tail, large at the base and gradually lessening, so that in this respect they approach the Ryzæna, which also come from Africa, although Buffon imagined they were natives of America.

FINIS.

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PLATE I.

Fig. 11. Skull of the *Maki*.

a. The frontal bone.

b. The nasal.

c. Superior maxillary.

d. The jugal.

e. The temporal.

f. The parietal.

g. The occiput.

i. The intermaxillary.

k. Inferior maxillary.

— 21. The os hyoïdis of the *Gibbon*, half the natural size.

— 22. Ditto of the *Mandrill*, half the natural size, viewed within.

— 23. Ditto viewed without.

— 24. Ditto of the *Mycetes*, half the natural size.

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PLATE II.

Fig. 10. Under view of the upper portion of the skull of an *Ass*.

1. Vomer.
2. Palate.
3. Posterior sphenoïd.
4. Basilar.
5. Anterior sphenoïd.
6. Condyloïd.
8. Os petrosum.
9. Superior maxillary.
10. Jugal.
11. Temporal.
12. Frontal.
13. Intermaxillary.
14. Continuation of the temporal.

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PLATE III.

Fig. 1. The brain of a *Macaco.*

1. Anterior lobe.
2. Middle lobe.
3. Posterior lobe, only found in the *Quadrumana.*

c. Cerebellum.

— 2. The transverse articulation of the lower jaw of the *Sarcophaga.*

— 3. The longitudinal articulation of the lower jaw of the *Rodentia.*

— 4. The stomachs of the *Ruminantia.*

1. Pylorus.
2. Œsophagus.
3. First Stomach or Paunch.
4. Second ditto or Honeycomb.
5. Third ditto or Feck.
6. Fourth ditto or Reed.

— 5. The crown of a grinder of one of the *Ruminantia.*

— 6. The inmost lower grinder of a *Papio.*

— 7. The inmost lower grinder of a *Cercopithecus.*

— 8. Arm and hand of a *Dolphin.*

— 9. Skull of a *Mammoth;* the dotted parts have not yet been found.

— 10. Upper jaw of an *Elephant.*

— 11. Ditto of a *Mammoth.*

— 12. Skull of a *Lori,* shewing the immense developement of the jugal to accommodate the large eyes.

— 13. The nostril of a *Macaco.*

— 15. Ditto of a *Cynocephalus.*

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PLATE IV.

Fig. 1. Skull of the *Pongo* of Borneo, one-fourth the natural size.

— 2. Ditto of the *S. Satyrus*, one-fourth the natural size.

— 3. Ditto of the *Troglodytes*, one-fourth the natural size.

— 4. Cervical vertebra of the *Pongo*.

a. The spinous process.

— 5. Cervical vertebra of *Man*.

The spinous processes of the *Orang* are almost as long as in fig. 4.

— 6. The heel bone of *Man*.

— 7. Ditto of the *Orang Outang*.

— 8. Ditto of the *Magot*.

— 9. Leg of the *Lemur Tardigradus*.

a. Metatarsus.

— 10. Leg of a *Tarsius*.

a. Metatarsus.

— 11. The nails of an *Echidna*.

— 12. Ditto of the *Aï*.

— 13. Lower jaw of a *Hedgehog*, natural size.

— 14. A grinder of the *Hedgehog*.

— 15. Incisives of the *Musaraigne*, double the natural size.

— 16. Teeth of a *Mygale*.

— 17. Teeth of a *Scalops*.

— 18. Inner view of the upper jaw of a *Glutton*.

a. The carnivorous tooth.

b. The tuberculous tooth.

— 19. Exterior view of the lower jaw of the *Glutton*.

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PLATE V.

Fig. 1. Upper jaw of a *Hyæna*: two-thirds the natural size.

— 2. Grinders of the *Bathyergus*, or *Cape Mole Rat*.

— 3. Ditto of an *Ondatra*.

— 4. Ditto of an *Echimys*.

— 5. Ditto of an *Orycteropus*.

— 6. Ditto of a *Porcupine*.

— 7. Ditto of a *Hare*.

— 8. Incisives of ditto.

— 9. Grinder of a *Cabiai*.

— 10. Lower carnivorous tooth of a *Civet*.

— 11 Incisive of the *Seal*.

— 12. Grinder of a *Castor*.

— 13. Lower jaw of a *Bear*.

— 14. Grinders of the *Aye Aye*.

— 15. Incisive of ditto, with the bone of the inner side of the jaw pared off, to shew the enormous size of the tooth, and the manner of its insertion.

— 16. Pelvis of the *Kanguroo;* to shew the two supernumerary bones for the support of the ventral pouch.

— 17. Grinder of an *Agouti* or *Dasyprocta*.

— 18. Ditto of the *Cobay*.

— 19. Upper jaw of the *Raccoon*.

— 20. Under jaw of ditto.

— 21. Skull of the *Beaver*.

— 22. Under jaw of the *Badger*.

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PLATE VI.

Simia Satyrus.

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PLATE VII.

Fig. 3. Head of a *Pteropus*.

— 4 Lower incisive of the *Galeopithecus*, inverted.

— 5. Dentated canine of ditto.

— 6. Head of a *Nyctinomys;* shewing the sloped upper lip. *(N. Egyptiacus).*

— 7. A *Molossus. (M. Ater).*

— 8. Head of a *Rhynopomis. (R. Microphylla).*

— 9. Ditto of a *Plecotus. (P. Viennæ).*

— 10. Grinders of the *Pteropus.*

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PLATE VIII.

Fig. 1. Hinder extremities of a *Stenodermis;* shewing the interfemoral membrane sloped out to the coccyx.

— 2. Head of a *Noctilio.* (Vespertilio Leporinus, *Gm.*)

— 3. Ditto of a *Phyllostoma.* (Ph. Elongatum, *Geoff.*)

— 4. Ditto of a *Nycteris.* (N. Javenensis).

— 5. Ditto of a *Rhinolophus.* (R. Diadema, *Geoff.*)

— 6. Ditto of a *Megaderma.* (M. Lyra, *Geoff.*)

— 7. The fore leg of a *Camel,* shewing the absence of the fibula, and the union of the two bones of the metacarpus into one, called the canon.

— 8. Ditto of a *Mammoth.* These two figures shew the remarkable difference of the disposition of the bones of the legs in the two Orders, each figure containing the same bones, *i. e.* the humerus, radius, (with the ulna in the Mammoth), those of the carpus, metacarpus, and the joints of the toes.

— 9. The carpus of *Man.*

a. The scaphoid.

b. The semilunar.

c. The cuneiform.

d. The pisiform.

e. The trapezium.

f. The trapezoid.

g. The os magnum.

h. The luniform.

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PLATE IX.

Fig. 1. A grinder of a *Foal.* (Equus Caballus.)

— 2. Ditto of the *Asiatic Elephant.*

— 3. Ditto of the *African Elephant.*

— 4. Lower grinder of the *Rhinoceros.*

— 5. Upper ditto.

— 6. Grinder of the *Mammoth.*

— 7. Ditto of the *Hippopotamus.*

— 8. Lower incisives of a horse of four years and a half, the canines just appearing.

— 9. Grinder of a *Tapir*, before trituration.

— 10. Inmost grinder of a *Tapir* after trituration.

— 11. The middle upper incisive of an *Otary*, viewed sideways.

— 12. A lower incisive of ditto, viewed from behind.

— 13. The posterior extremities of a *Seal.*

a. a. The knees.

b. b. heels.

c. c. metatarsi.

d. d. toes.

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PLATE X.

Fig. 1. The under view of a *Man's* skull.

1. The occiput.
2. Lambdoidal suture.
3. Temporal.
4. Basilar.
5. Vomer.
6. Jugal.
7. Sphenoïd.
8. Apophysis of the Sphenoïd.
9. Palate.
10, 11. Superior maxillary.

The intermaxillary, divided from 11, should have been marked 12.

Fig. 2. Upper jaw of the *Ornithorynchus*.

a. and *b*. the teeth.

— 3. Lower jaw of ditto.

a. and *b*. the teeth.

— 4. Interior view of the upper jaw of an *Elephant*.

— 5. Ditto of the lower ditto.

— 6. A vertebra of a *Whale*.

— 7. Ditto of an *Elephant*: that of the *Mammoth* is of the same form, but of shorter and thicker proportions, as are all the other bones of its body.

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PLATE XI.

Fig. 1. Skull of a *Tapir.*
— 2. Ditto of a *Palæotherium.*
— 3. Ditto of an *Anoplotherium.* (A. Commune.)
— 4. Ditto ditto. (A. Medium.)
— 5. Ditto of the *Fossil Bear.*
— 6. Ditto of the *Black Bear of Europe.*
— 7. Ditto of the *Polar Bear.*
— 8. Horn of the *Dama.*
— 9. Ditto of an *Antelope.*
— 10. Ditto of the *Cama.*

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PLATE XII.

Fig. 1. Upper jaw of the *Balæna Boops.*

— 2. Lower ditto of the *Physeter Macrocephalus.*

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PLATE XIII.

Fig. 1. The *Megatherium.*

— 2. Skull of the *Sloth.*

— 3. Ditto of the *Dugong.*

— 4. Ditto of the *Fossil Elephant.*

— 5. Ditto of the *African* ditto.

— 6. Ditto of the *Asiatic* ditto.

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PLATE XIV.

Fig. 1. *Egyptian Goat.*

— 2. *Aye Aye.*

— 3. *Wombat.*

— 4. *Ornithorhynchus.*

— 5. *Maiba.*

— 6. Skull of the American *Manatus.*

— 7. Ditto of the African *Manatus.*

a. Intermaxillary.

b. Sub-orbitary hole.

c. Interior part of intermaxillary.

d. Frontal with its anterior branch.

e. The cheek bone.

f. Zygomatic apophysis of the temporal, thicker than in any other animal.

h. The hole, unusually large, for the maxillary muscle.

— 8. Pelvis of the *Aï.*

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PLATE XV.

Fig. 1. The skull of a *Woman.*

a. The frontal.
b. Nasal.
c. Ethmoïd.
d. Jugal.
e. Upper maxillary.
f. The temporal sphenoïd.
g. Parietal.
h. Temporal.
i. Occipital.
k. Sphenoïd.
l. Frontal suture.
m. Sagital suture.
n. Temporal suture.
o. Lambdoidal suture.

Fig. 2. The skull of a *Lion.*
— 3. Ditto of a *Tiger.*
— 4. Ditto of the *Fossil Elk.*
— 5. Ditto of the *Black Tiger.*
— 6. Ditto of a *Panther.*
— 7. Ditto of a *Jaguar.*
— 8. Ditto of an *Aurochs.*
— 9. Ditto of a *Fossil Ox.*
— 10. Ditto ditto.
— 11. Part of the skull of a *Fossil Deer.*
— 12. Skull of a '*Bull without horns.*'
— 13. Ditto of a *Fossil Buffalo.*
— 14. Ditto of the *Fossil Aurochs.*
— 15. Ditto of a *Buffalo.*
— 16. *Ursus Longirostris.*

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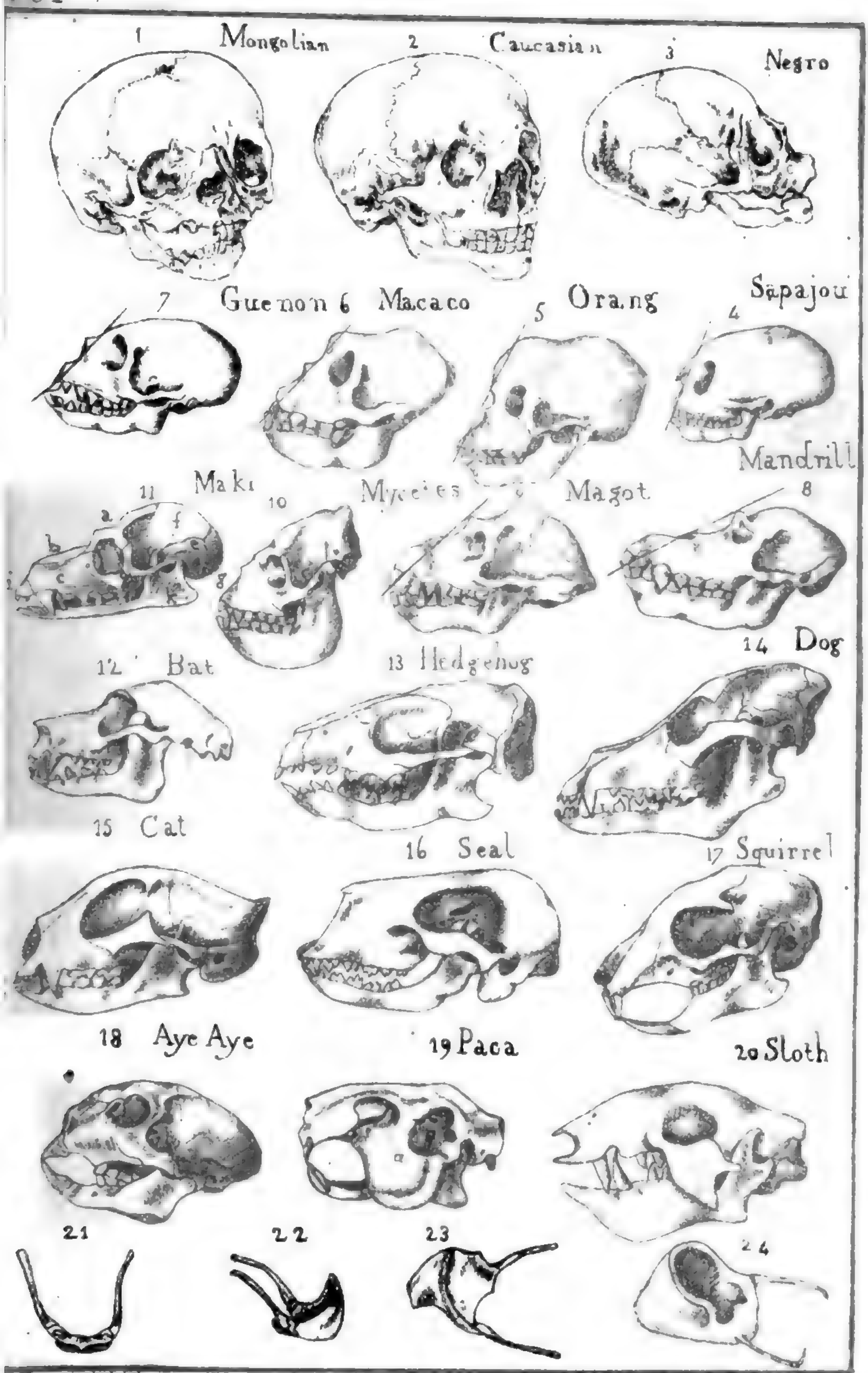

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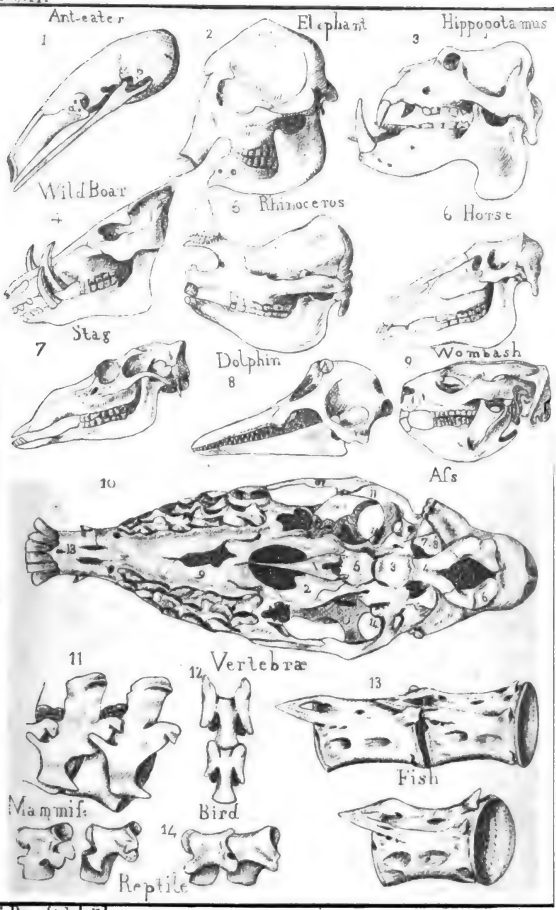

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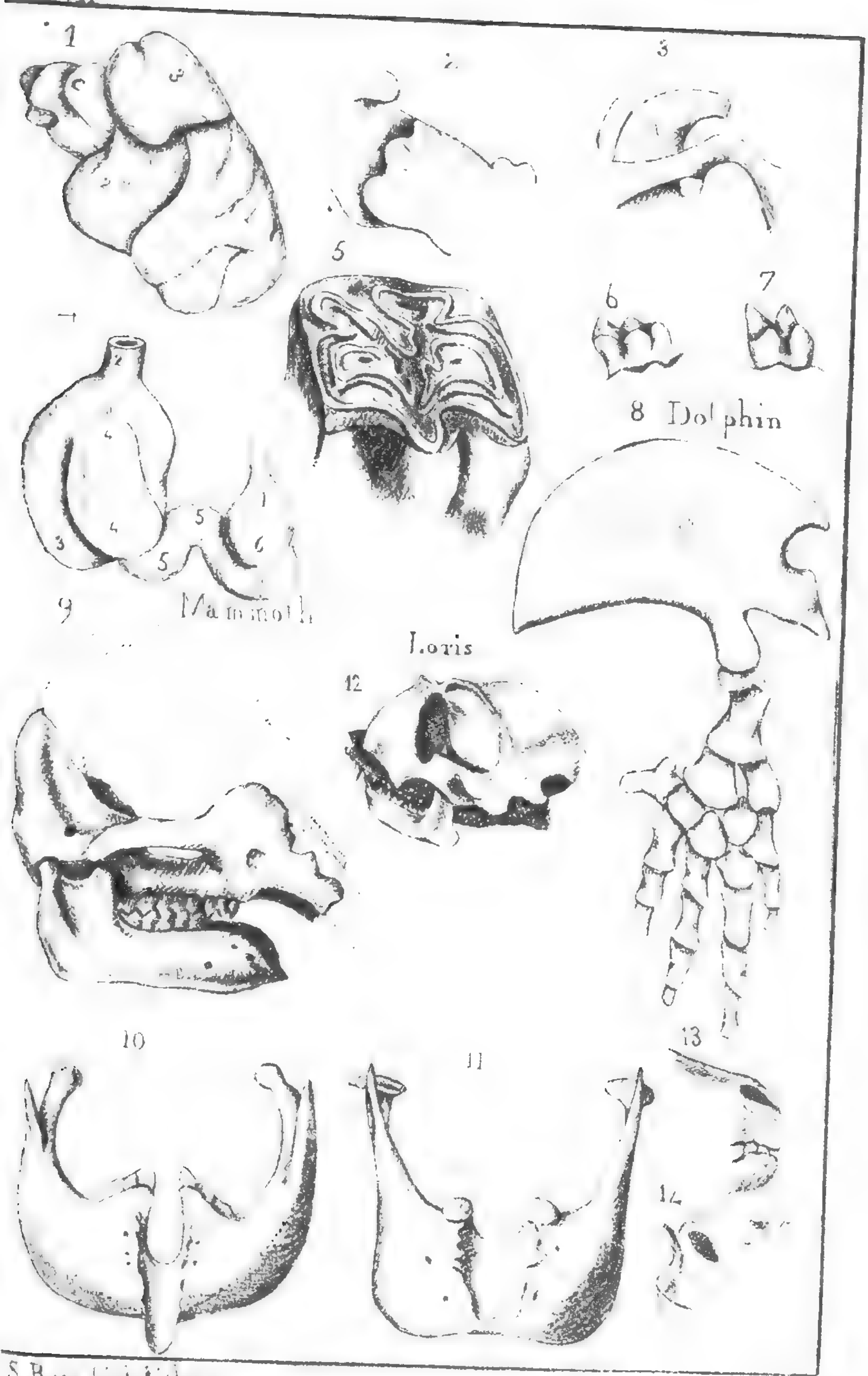

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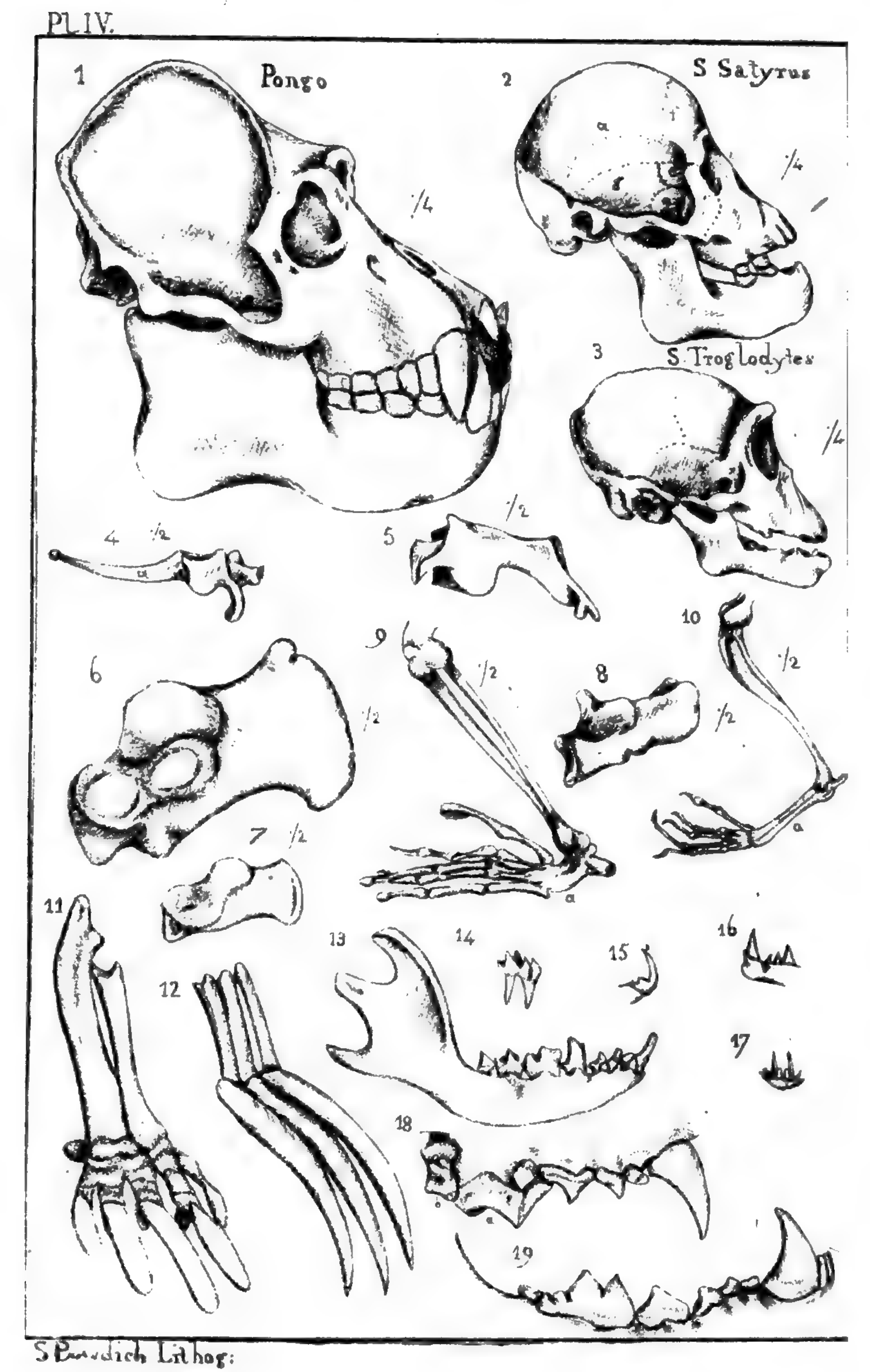

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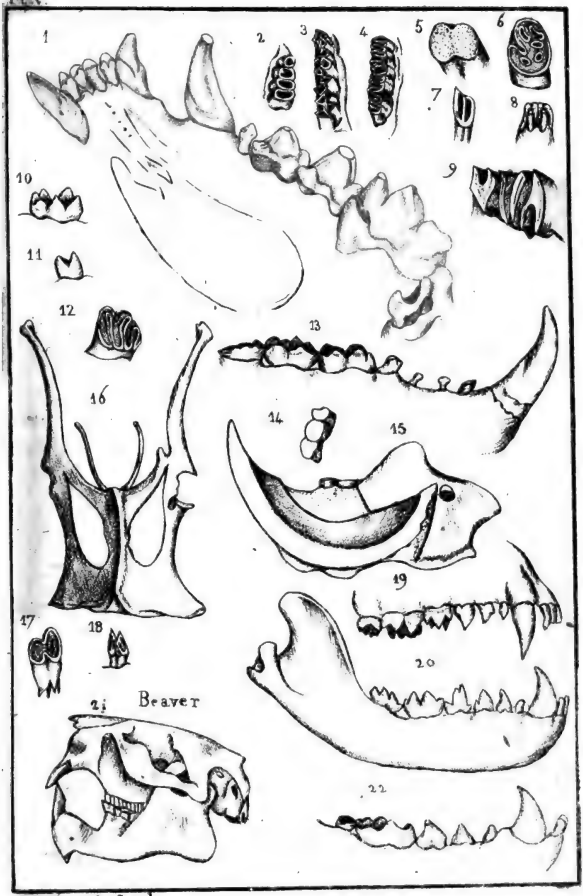

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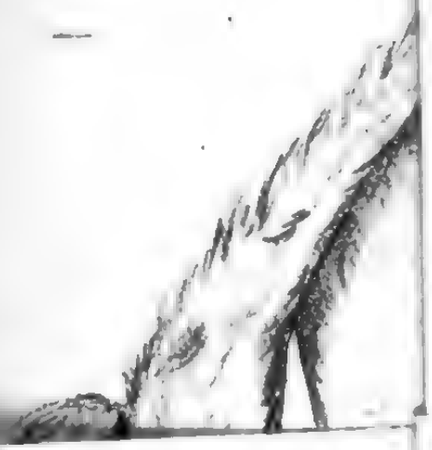
Pl. VI.

S. Satyrus



Pl. VII.

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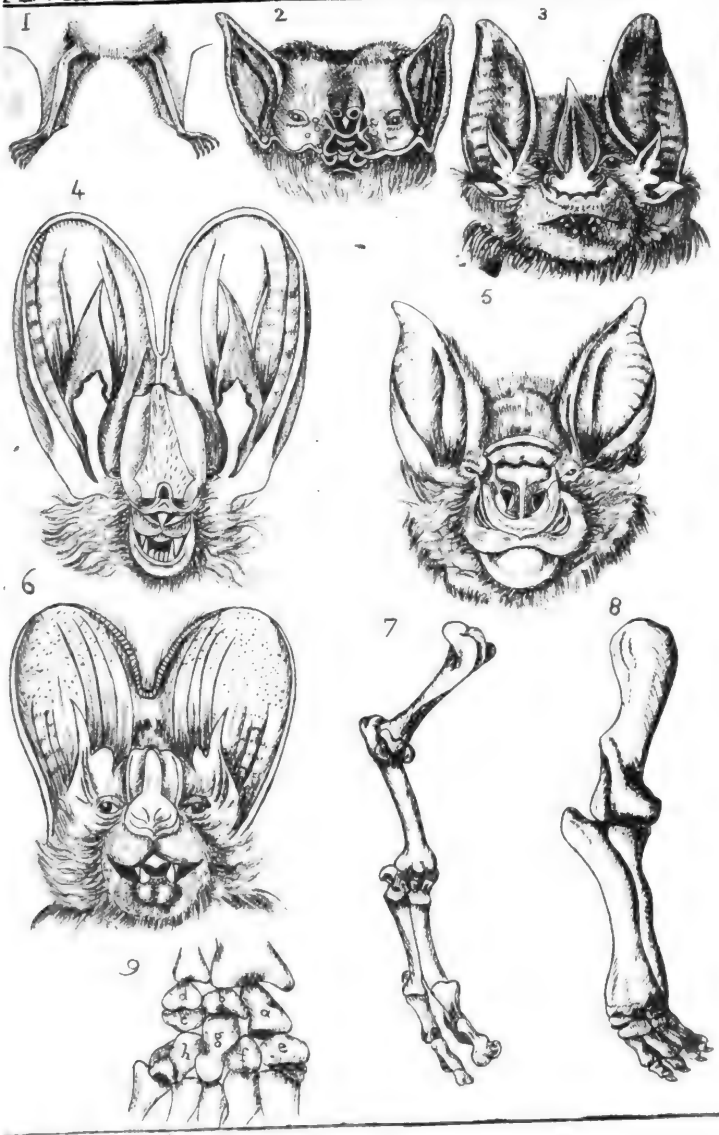
PL. VIII.



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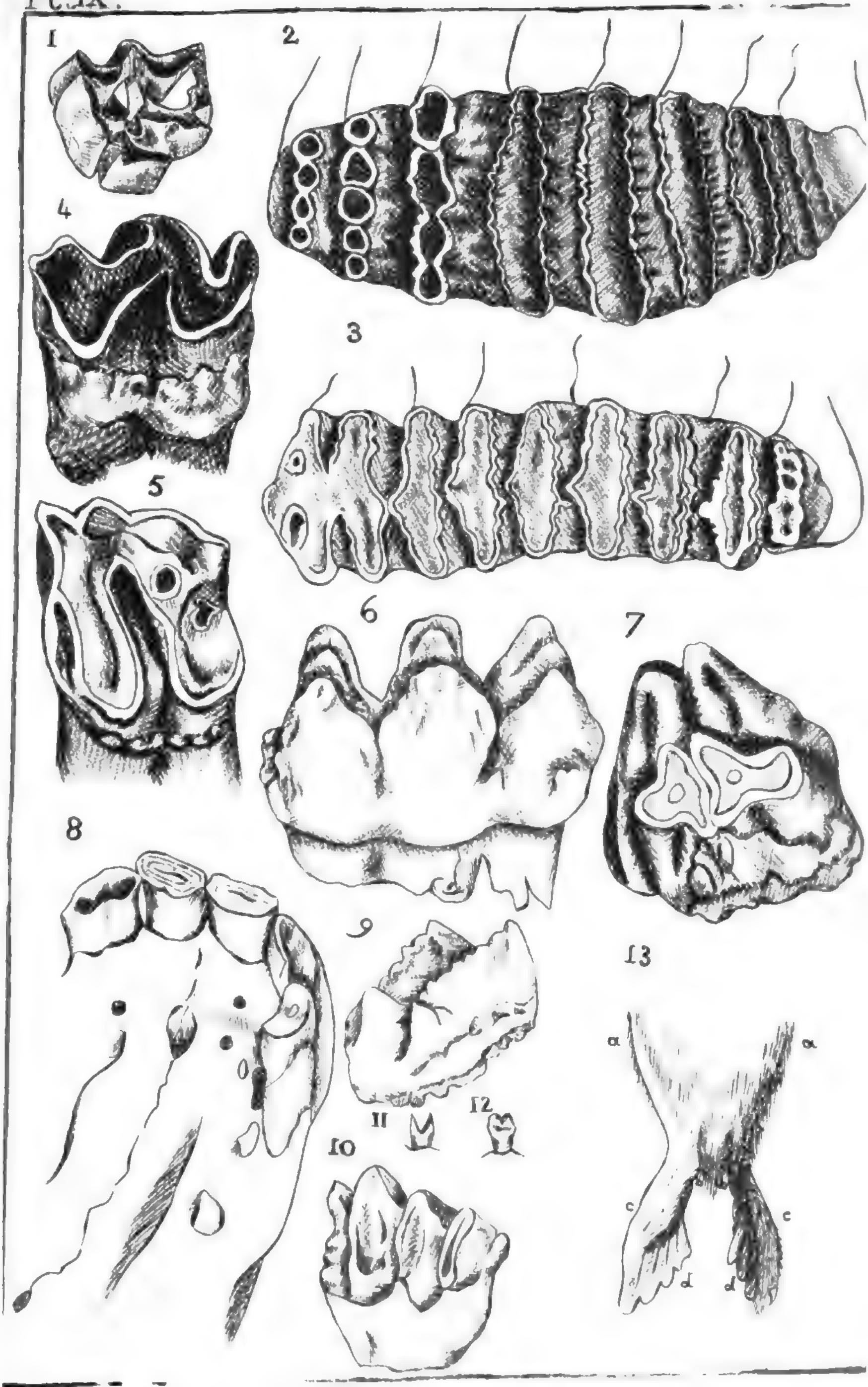

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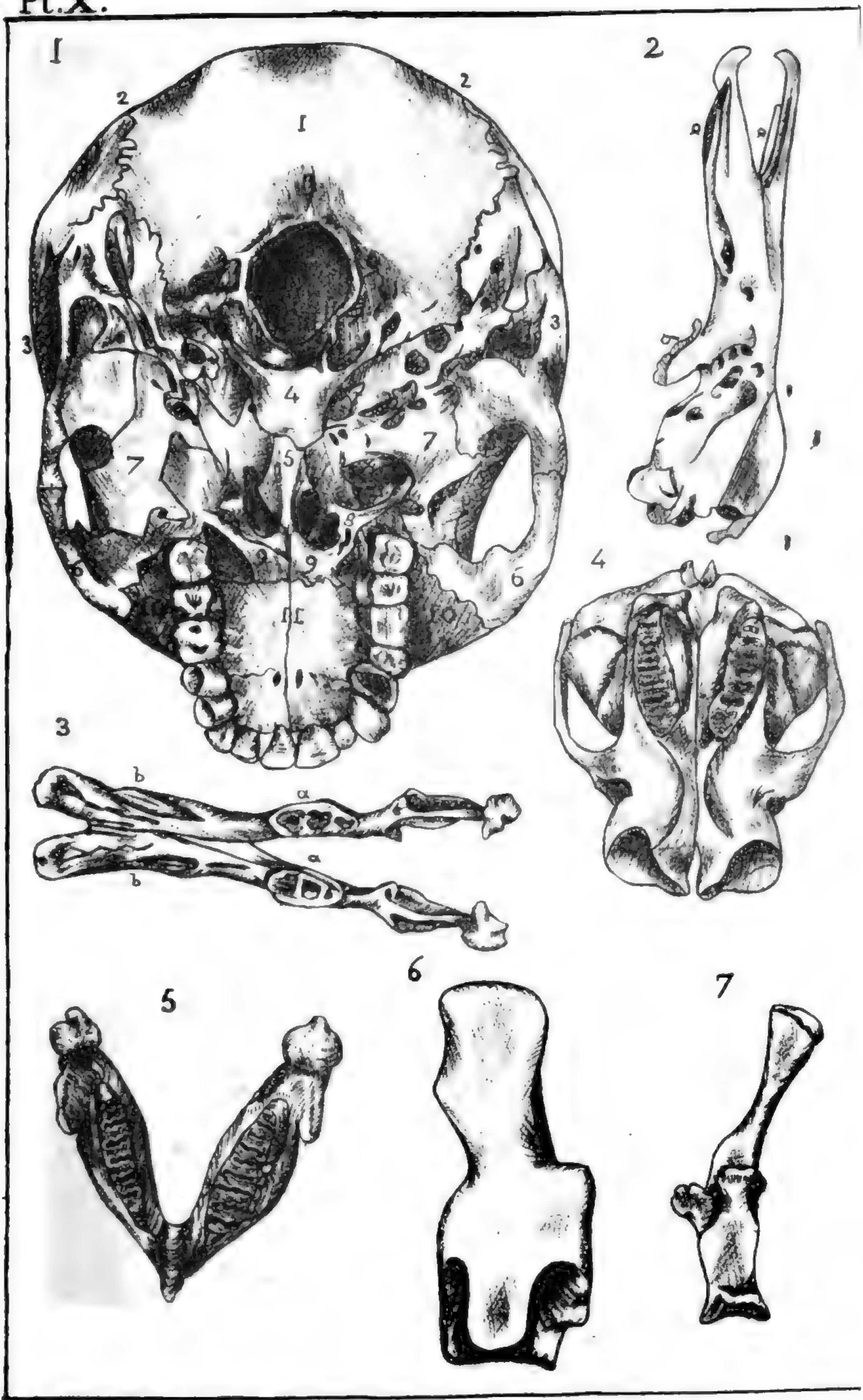
Pl.X.



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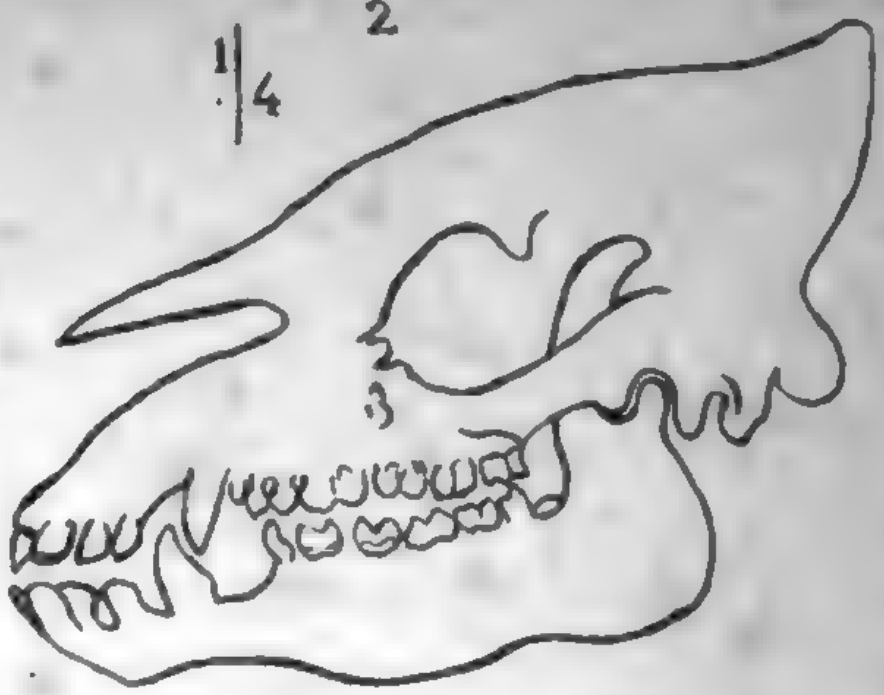

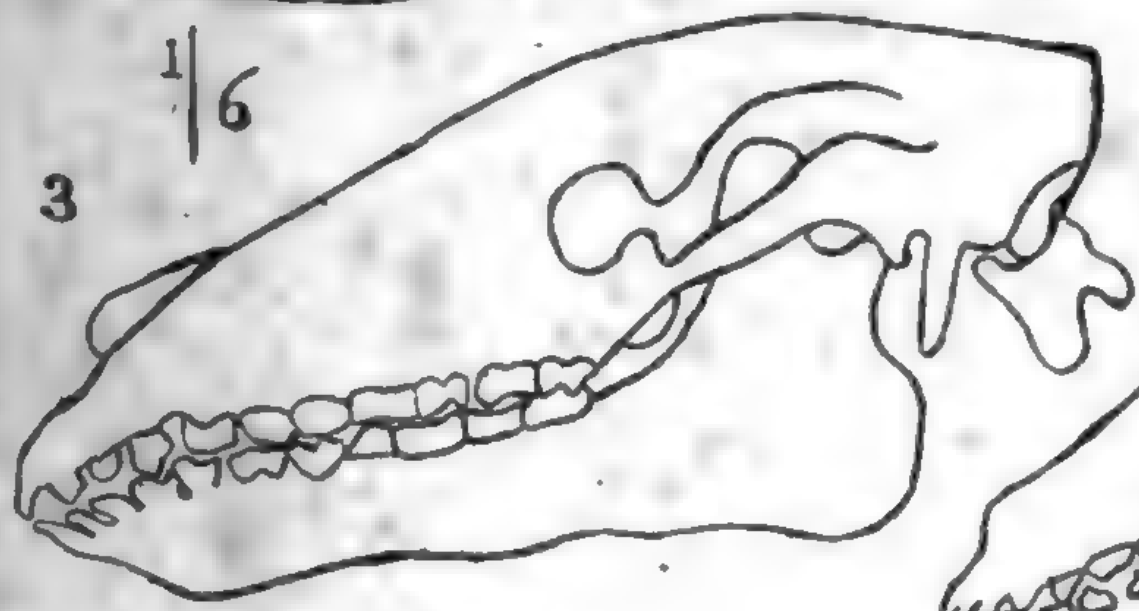

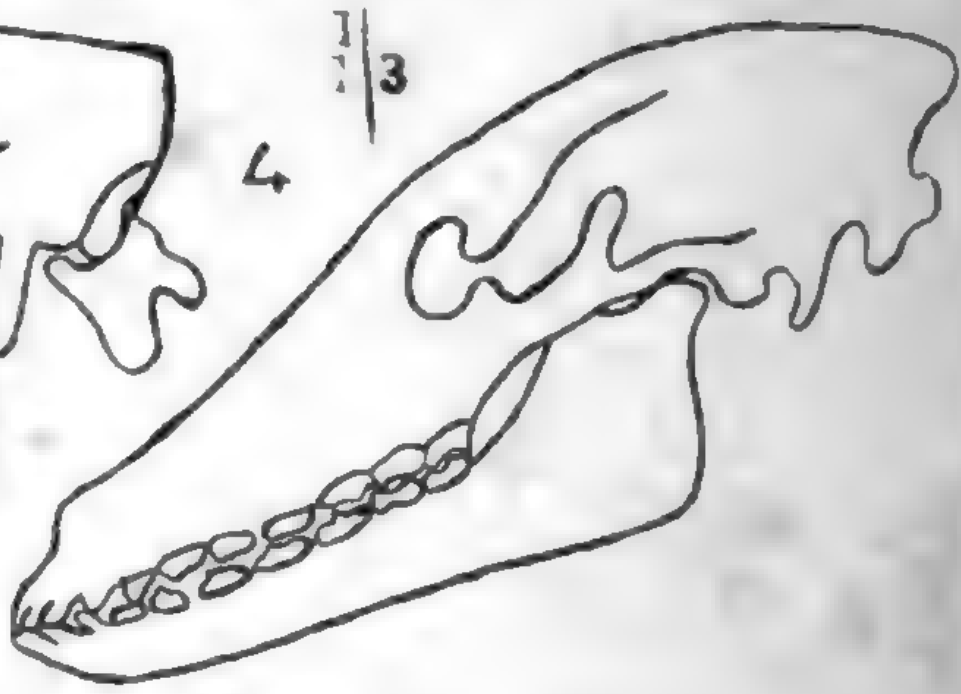

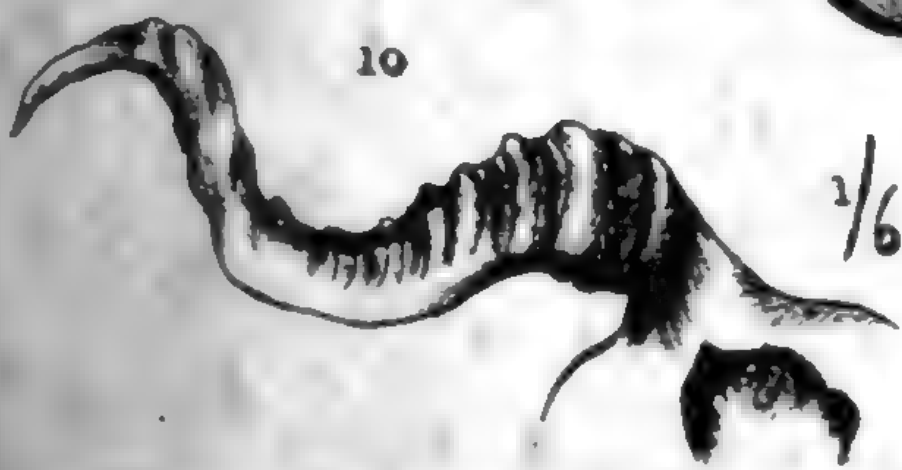

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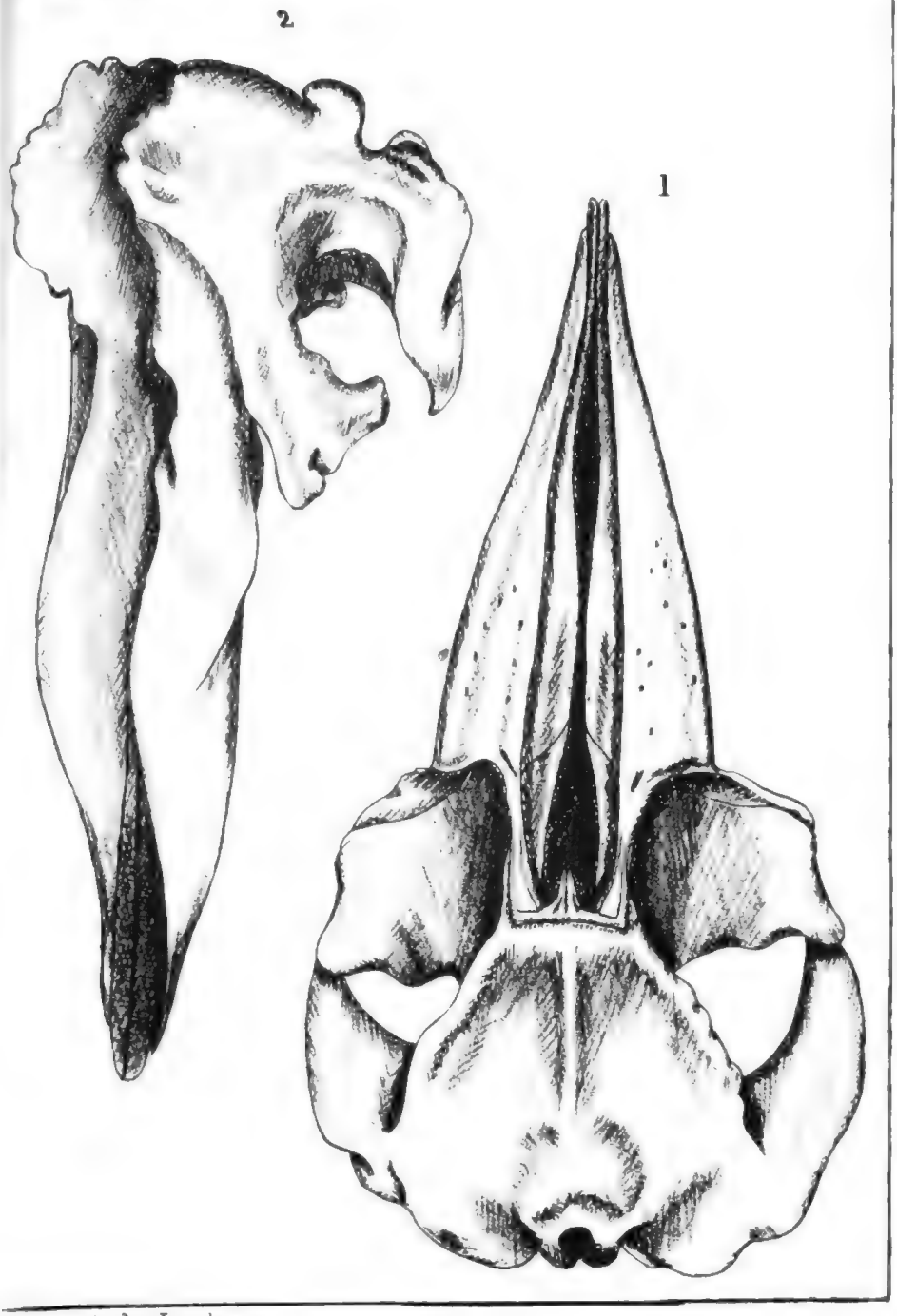

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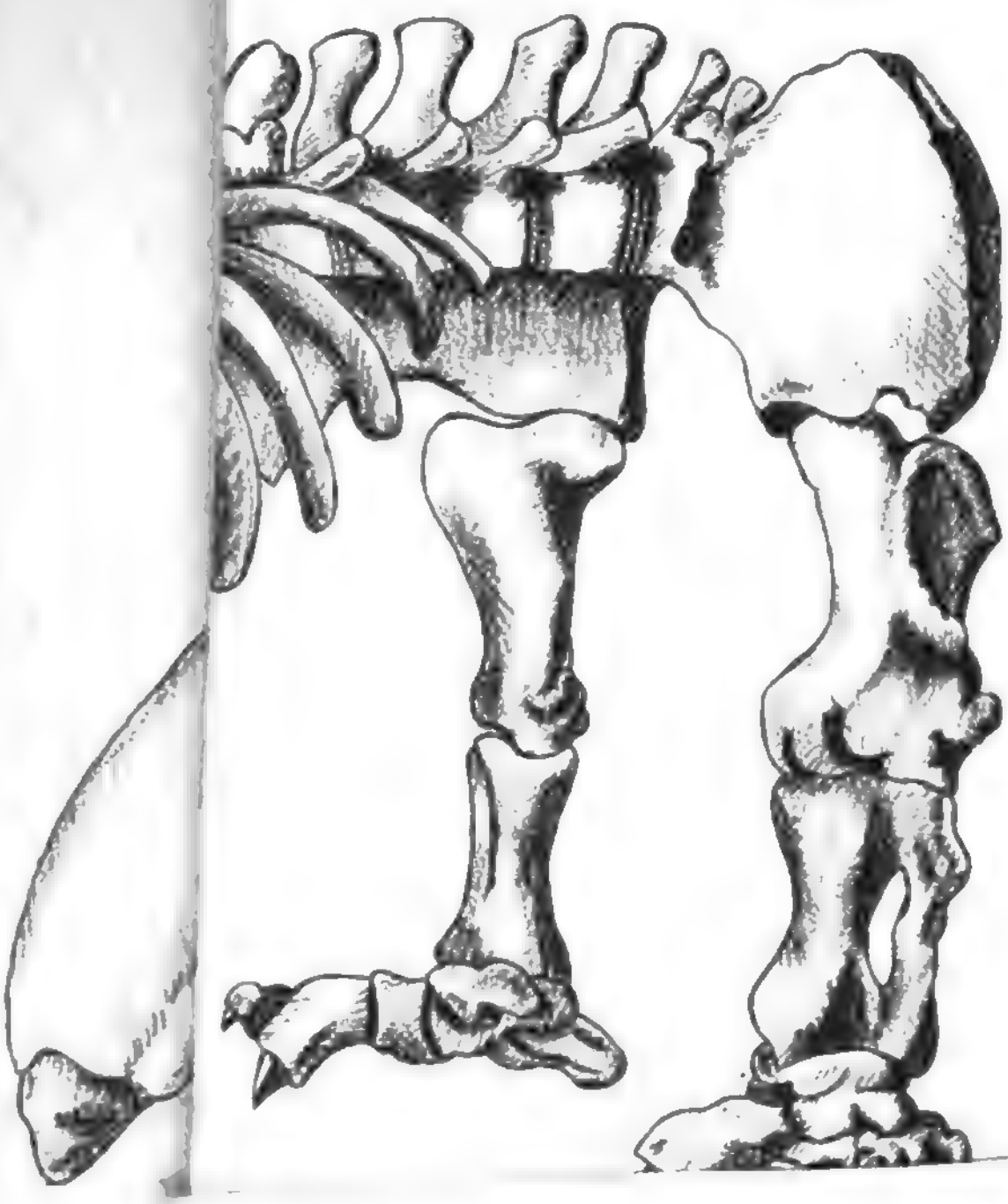

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